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THE FAR EASTERN REVIEW

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THE GEOLOGIC HISTORY OF CHINA

[BY PROF. ELIOT BLACKWELDER, UNIVERSITY OF WISCONSIN]

The Chinese Empire includes an area larger than the United States with the addition of Alaska and our insular possessions. A large part of this vast area, however, is made up of dependencies which are but loosely joined to China proper, and are not essential to its integrity. She has lost and regained these dependencies from time to time in the past, and the same process may continue. Divested of its outlying possessions, China consists of 18 Provinces, which may be compared in a general way to our States. The Provinces are, however, generally larger than the States and on the whole, much more populous. There is still greater dissimilarity in government because, whereas our States are representative democracies, the Chinese Provinces were, at least until within a year or two, satrapies ruled absolutely by imperial governors or viceroys.

Not a few people in America picture China as a vast fertile plain, perhaps like the upper Mississippi Valley, densely populated and intensively cultivated. In fact, however, it is so generally mountainous that less than one-tenth of its surface is even moderately flat. On the west, especially, it is ribbed with cordillera from which its two great rivers, the Yangtze and the Hwang, flow eastward to the Pacific.

In addition to this diversity of surface, there is also much variety of climate. In the northwest the conditions are dry and severe, like those of Montana and central Wyoming, while in the south-east they are humid and subtropical, approaching those of the Philippine Islands. Such are the extremes.

It is a fact well known to geologists that continents, and therefore countries, have not always existed in their present state, but that they have been built as a result of successive events and changes of conditions. If we were to dig beneath the sur-

face in any part of China, we should find first one stratum and then another, and we should see also that these strata have been bent, cracked, and otherwise disturbed. Some of these structures are old and some young. It would be somewhat like excavating in an ancient city, where one house or temple has been built upon the ruins of its predecessor, and each affords a crude record of its time. The geologic structure of such a country as China has been determined largely by the rocks of which it consists, partly

by the climate to which it has been subject, but chiefly by the geologic events which have occurred during its history.

Of course the beginning of that history of China shades into darkness when we attempt to trace it back into the remote ages. But the present features of the land are chiefly due to the later events in its life, and these have been partly worked out by the geologists who have explored its surface.

We may take as a convenient starting point for our interpretation a time far back in geologic chronology, when China was a land surface which had been exposed to erosion so long that nearly all the hills and mountains that may have existed there before had been worn away, leaving a relatively flat plain, with groups of low hills here and there. The rocks beneath this plain were of various kinds, most of them highly folded. Eventually this surface was submerged beneath a comparatively shallow inland sea; and although the uneasy movements of the earth's body caused the sea bottom to emerge occasionally, it remained

below the water nearly all through the geologic periods which constitute the Paleozoic era. By the end of that time we may picture China as a shallow sea bottom rising very gradually to a marshy coastal plain on the east. During the long intervening ages the accumulation of sediments upon the sea bottom had formed successive layers of limestone, shale, and sandstone,



RELIEF MAP OF CHINA SHOWING THE RELATION OF PLAINS TO MOUNTAINS

which eventually reached a thickness of 5,000-10,000 feet.

This condition did not hold without end, for eventually strong compressive forces engendered in the underlying body of the earth squeezed the superficial rocks into folds, and thus bulged the surface high above sea level in the region so affected. By the prompt attack of streams, winds, glaciers, and the other agencies which are incessantly sculpturing the surface of the earth, these elevated districts were, even while rising, carved into rugged mountains and deep valleys, so that the original folds were greatly disfigured, even before the compressive force ceased to operate.

It is a fact generally recognized among geologists that in terms of geologic time such episodes of compression and folding are short lived. They are soon followed by much longer periods, during which the internal forces of the earth are quiescent but in which the erosive agencies have free play. If any land remains indefinitely above sea level and is not disturbed by movements from below, the mountains and hills will eventually be worn away and there will be left only a broad, almost featureless, plain. It is believed that China, in consequence of such a period of quiescence, was reduced to a lowland from which almost all of the pre-existing mountains had been removed. In this condition it probably remained for more than one geologic period, and the western part may even have been submerged beneath the sea which at that time covered northern India and part of Tibet. In that sea were deposited the thick beds of limestone which are now found in some of the western mountain ridges.

Again, in the Miocene period the forces of distortion within the earth accumulated to such strength that they were able to repeat the mashing and folding, but this time the area affected lay farther to the west and south. At the same time, or perhaps earlier, the eastern part of China was cracked in various directions; and the intervening blocks, settling somewhat unevenly upon their bases, left a group of escarpments and depressions comparable to those now to be found in western Nevada and southern Oregon. As before, the work of erosion and the leveling of the surface was at once accelerated, so that even before the deformation had spent itself the blocks were deeply scarred. It is uncertain how far this period of erosion succeeded in reducing China to base level. The consummation may have been prevented by gentle warpings of the surface, rising very slowly here and sinking there. When compared with the great breadth of the areas affected, these changes of level seem very slight, but they are nevertheless sufficient to cause great changes in the aspect of the country.

It is one of the basal principles of physiography that streams tend to produce in their channels an almost uniform slope from their head-waters to the sea. If any part of the channel is so flat that the stream is too sluggish to carry sediment, it is built up until it reaches the required gradient; and on the other hand, if any part has too steep a declivity, it is gradually worn down to the proper slope. In consequence of this law, the parts of China which were slightly bulged above their original levels were reattacked by the branching systems of rivers

with renewed vigor. By carving out the softer rocks, these have made deep valleys with intervening mountain ranges.

Some of the larger rivers, such as the Yangtze, maintained their courses in spite of the slow uplifts directly athwart their courses. A result is the magnificent series of gorges along the central Yangtze where the great river has sawed its way through a slowly rising mass of hard, complexly folded rocks.

On the other hand, the broad areas which were depressed not only below the general level of stream action, but below sea level, were rapidly filled with sand, loam, and clay washed down out of the adjacent mountains by the streams. The process of filling the depressions is the exact complement of the process of etching out the highlands. No doubt the rivers have been able in large measure to keep pace with the sinking movement of the ground, so that great rivers like the Hwang may have maintained perfectly graded courses across the region of depression from the mountains to the sea. While thus engaged in building up its channel, the river in time of flood frequently breaks through its low banks, shifts its channel, and then begins to fill up a new and hitherto lower part of its surroundings. By

the long continuance of this process of repeated shiftings and fillings, the great eastern plain of China and many smaller plains have been produced. It is here, where the population is densest and the rivers least confined, that the devastation by floods and their attendant famines is greatest.

By this succession of events the surface of China is believed to have reached its modern condition.

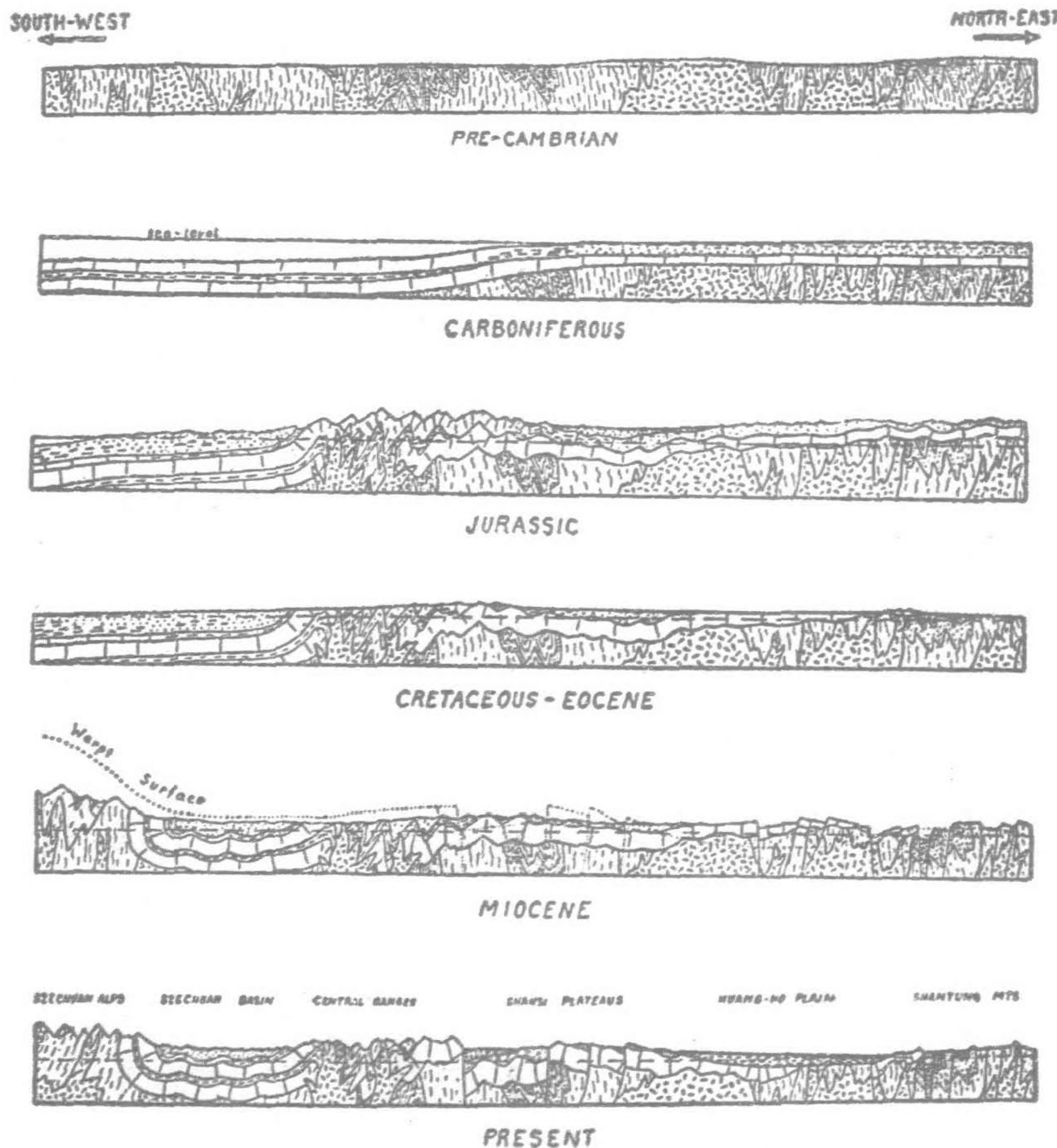
We may now consider it piecemeal and see how the existing geologic conditions, which are the result of this long series of past changes, influence the habits, occupations, and even mental traits of the people. Because space is limited and also because I have not seen all the physiographic divisions of China, it will not be possible for me, even briefly, to describe each of them. A few are therefore selected to show the range of variety of the whole.

The mountains of north-eastern China, typified by the province of Shantung, are unlike those of the rest of the country in several respects. Although the individual peaks are often

sharp and rocky they are generally separated by wide, flat-bottomed valleys. The process of erosion has here gone so far that the rivers have already carried away most of the land, leaving only isolated groups of low mountains. The broad valleys accommodate a relatively large number of people, who congregate in the villages dotting the intermontane plains. In contrast with most mountainous regions, travel between the different valleys is comparatively easy here, because many of the passes are but little higher than the plains themselves, and constitute scarcely any obstacle to progress. Roads are plentiful, and so the cart and the wheelbarrow are the principal vehicles for through traffic.

This is one of the few parts of China where boats can be but little used. The streams are shallow and full of sand bars, and on account of the pronounced wet and dry seasons many of them are intermittent. For these reasons the majority of them are not navigable.

The deeply eroded land of Shantung has, however, suffered a relatively recent movement—apparently a sinking of the land—



DIAGRAMS TO ILLUSTRATE GEOLOGICAL CONDITIONS IN CHINA AT DIFFERENT PERIODS IN ITS HISTORY

which has allowed the ocean to penetrate the mouths of many of the coastal valleys. This marginal drowning has produced some excellent harbors, such as that of Chefoo, the great silk port, and Tsingtau, the German stronghold.

On the west, and encircling the Shantung hills, lies the great plain of the Hwang or Yellow River, which will serve as the type of many much smaller plains in various parts of China. As explained before, this vast gently sloping plain has been built by the Yellow River and some of its tributaries in an effort to preserve a uniform gradient across the sunken portion of eastern China. Like the Lower Mississippi and all other rivers which are building up rather than cutting down their beds, the Hwang is subject to frequent floods and occasional shiftings of its channel. Its course between the mountains and the sea has thus been changed more than fifteen times in the last 3,000 years. In these incessant shiftings the river has strewn all over an enormous area, 500 miles from north to south by 300 miles from east to west, layer after layer of fine yellow loam or silt; the very name "Yellow River," which is a translation of the Chinese "Hwang-ho," suggests the close resemblance to our own mud-laden Missouri. Almost every square foot of this vast alluvial fan is, of course, underlain by a deep and fertile soil, and is intensively cultivated by the industrious Chinese inhabitants.

One sees no large fields of grain, such as those on our Dakota prairies, but, instead, thousands of small truck gardens belonging to the inhabitants of the hundreds of little mud-walled villages with which the plain is dotted. The ever-present town walls have doubtless been built because the inhabitants have no natural refuges, as their mountain cousins have, and their very accessibility has made them in the past the frequent prey of Mongol and Tartar invaders or of rebels and rioters from within their own country.

Since the water supply of the plain is not lavish, but little rice is grown there. The dry-land grains and such vegetables as cabbages and potatoes are the staple crops. The small gardens are sparingly irrigated, however, in times of drought, by water taken from the canals or wells, with the help of various types of crude pumps operated by men or by donkeys.

In this densely populated alluvial plain there is practically no pasturage and no woodland. From the very nature of the plain it could not yield coal, which is always associated with the solid rocks. To bring fuel, as we do, from distant parts of the country is impossibly expensive for the Chinese, without an adequate railroad system, and that is still a thing of the future. When the harvest has been gathered in the autumn the village children are therefore sent out to gather up every scrap of straw or stubble that can be used either for fodder or for fuel.

The fields thus left perfectly bare in the dry winter season afford an unlimited supply of fine dust to every wind that blows. This is doubtless the explanation of the disagreeable winter dust

storms with which every foreigner who has lived in northern China is only too familiar.

Although carts and wheelbarrows are much used on the Hwang plain, their traffic is chiefly local. That may be due in part to the fact that the numerous wide and shifty rivers are difficult to bridge, while ferrying is relatively expensive. Another, and perhaps more important, reason is that the rivers, and particularly their old, abandoned courses, afford natural waterways which are available nearly everywhere. By taking advantage of these or by deepening them, and in some places by actually digging canals through the soft material of the plain, the Chinese have put together the wonderful system of interlaced canals for which they have been renowned since Europeans first visited them. The thousands of junks which

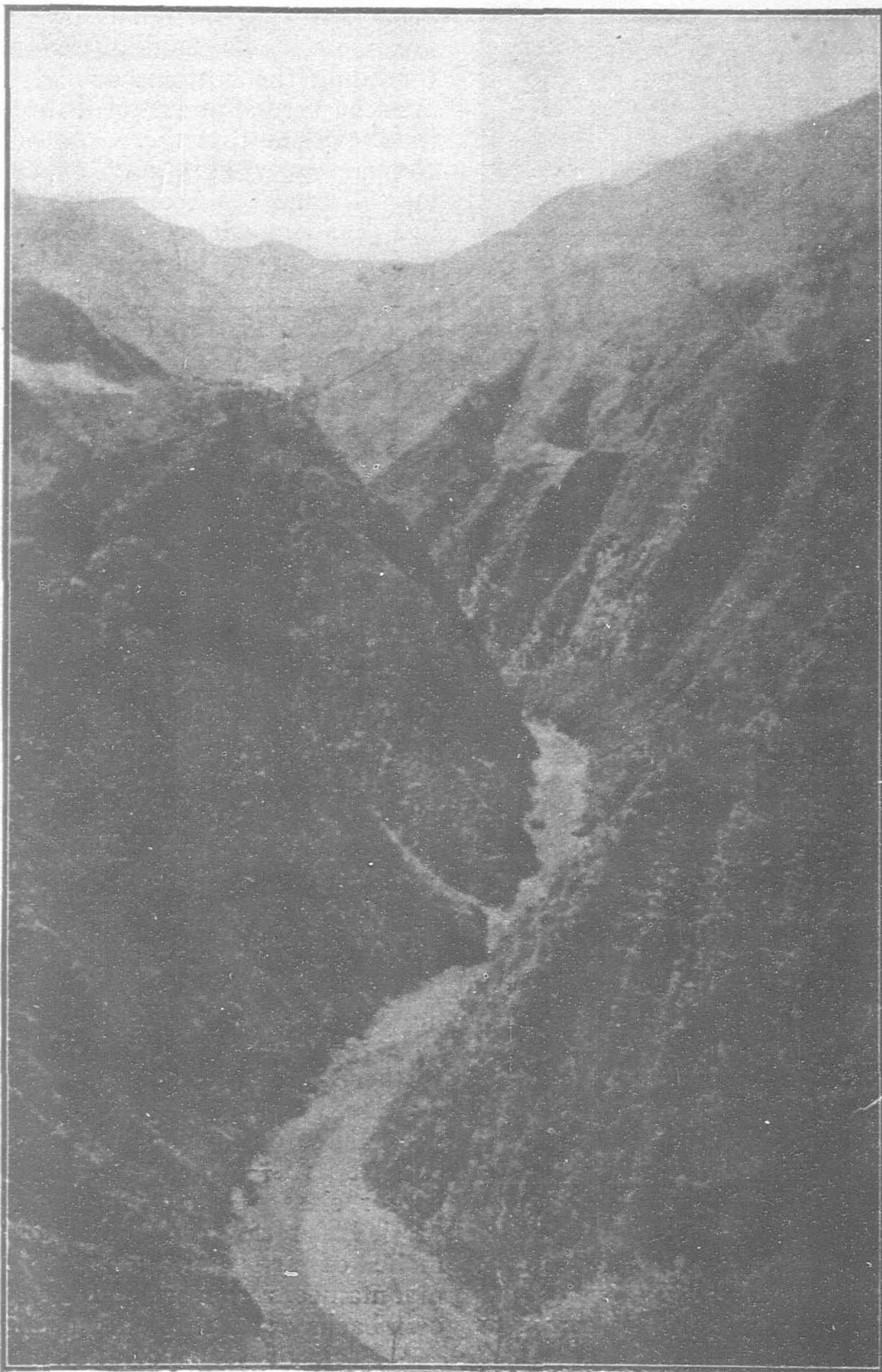
ply these waterways maintain a volume of inland commerce, which is inferior only to that of the great railroad countries, such as the United States. The relative freedom of communication in this great plain of the Yellow River has helped to bring about a greater homogeneity in the people than in any other equally large part of China. Here we find a single dialect in use over the entire region, whereas in some parts of southern China the natives of even adjacent valleys speak languages almost unintelligible to each other.

The other common effects of isolation, such as the lack of acquaintance with the customs of outside peoples, the hatred of foreigners, the peculiar local usages, and many other things, are less prominent here than in other parts of the empire. Excepting the coastal cities, there is no safer part of China for foreigners to travel through.

West and northwest of the Yellow River Plain lie the more rugged plateaus and mountains of northwest China, with their subarid climate presaging the approach to the deserts of Mongolia. Over much of this region the ancient limestones and sandstones are still horizontal or are gently folded, with occasional dislocations along faults. On account of the comparatively recent uplift and differential warping which this part of China has suffered, the streams have been greatly accelerated in their work, so that they have hollowed out canyons in the

raised portions and have filled in the depressed basins with sand and silt. This is the region celebrated among geologists on account of the loess, or yellow earth, which lines the basins and mantles the hillsides everywhere. It is believed that this is very largely a deposit of wind-blown dust, although it has been worked over considerably by the streams from time to time. No doubt Baron von Richthofen, the distinguished German explorer, was near the truth when he concluded more than 40 years ago, that the "Yellow earth" was the dust of the central Asian deserts carried into China by the northwest winds.

The presence of the loess determines, in large measure, the mode of living adopted by the inhabitants. Because of its fertility and moisture-conserving properties, it is well adapted



A VALLEY IN THE TSIN-LING MOUNTAINS OF CENTRAL CHINA



MOUNTAIN STREAM ERODING BANKS, WASHING OUT RUDE TRAILS

to dry farming, and there is little water for irrigation. The Chinese are not content with using the level bottom lands, but successfully cultivate the hillsides wherever a deposit of the loess remains. In order to prevent the soil from washing off from these steep slopes, they build a series of stone walls, thus forming soil reservoirs or terraces. In this way nearly all of the soil is utilized.

In such a country rivers are not numerous and those which exist have many rapids and shoals. Boats are therefore but little used in northwest China. For both passenger and freight traffic, pack animals or rude vehicles are the chief reliance. For passengers there are also the palanquin or sedan chair and the mule litter. Where the country is not too rough, the two-wheeled cart is the usual conveyance for merchandise. Over the mountain passes, however, and in many of the smaller valleys, roads are so narrow that carts can not be used, and so here pack animals, particularly horses and mules, are substituted. The traveler in this part of China is often reminded of his proximity to Mongolia by the frequent sight of camels. They are nevertheless not indigenous beasts of burden and the inhabitants themselves do not use them.

In consequence of the swampy state which prevailed in this part of China far back in the carboniferous periods, thick deposits of coal were formed. These are now exposed in the deep valley slopes between beds of limestone and sandstone, and the circumstance has made Shansi Province the principal coal-producing district of China. The coal is mined by very primitive methods and as there is still no adequate system of railroads in this or any other part of the empire, the product can be transported only in carts or on pack animals. Either of these modes of carriage is so expensive that it becomes unprofitable to transport the coal more than 60 to 100 miles from the mine, and so the denizens of a great part of northern China, where fuel is scarce and the winters are severe, are no more able to obtain it than as if the United States contained the only coal fields in the world. The advantages that will accrue from the building of railroads in northern China are many, but one of the greatest will be the wide distribution of this essential fuel.

In going south by west from the plateau country, one enters a region of warmer climate and more generous rainfall, which, for want of a more distinctive name, I have called the Central Ranges. This is the part of China which was particularly affected by the rockfolding movements of the Jurassic period, and which in a much more recent time has been reelevated and therefore newly attacked by the streams and other erosive agencies. Broadly regarded, it is a complex of sharp mountain ridges and spurs with narrow intervening valleys.

The ridges are not so high, however, but that they are clad with vegetation, and the scenery is therefore not alpine. The surface is nevertheless very rugged and its internal relief averages at least 3,000 feet. The roughest parts of our Carolinas resemble it in a measure. In such a region obviously there is no room for a dense population. Wherever there is a little widening of the bottom of the valley there is a farm or occasionally a small village, and even the scattered benches high up the mountain sides are reached by steep trails and diligently cultivated. But even when all of these are combined, the total area of land under settlement is relatively small.

In this region there are no railroads whatever, and although wagon roads could be built in some places, they would be expensive and the Chinese have not yet attempted to make them. All travel and commerce, therefore, depend on the agency of pack animals or coolies, and the roads they follow are mere trails winding around the steep mountain sides or threading the bottoms of narrow valleys, where swift streams must be forded at frequent intervals. Under such circumstances it is evident that there can be but little effective traffic. Only comparatively light and expensive articles can be transported long distances. Around the edge of the mountain mass where the populous cities of the adjoining plains can be reached with one or two days' travel there has been for centuries an



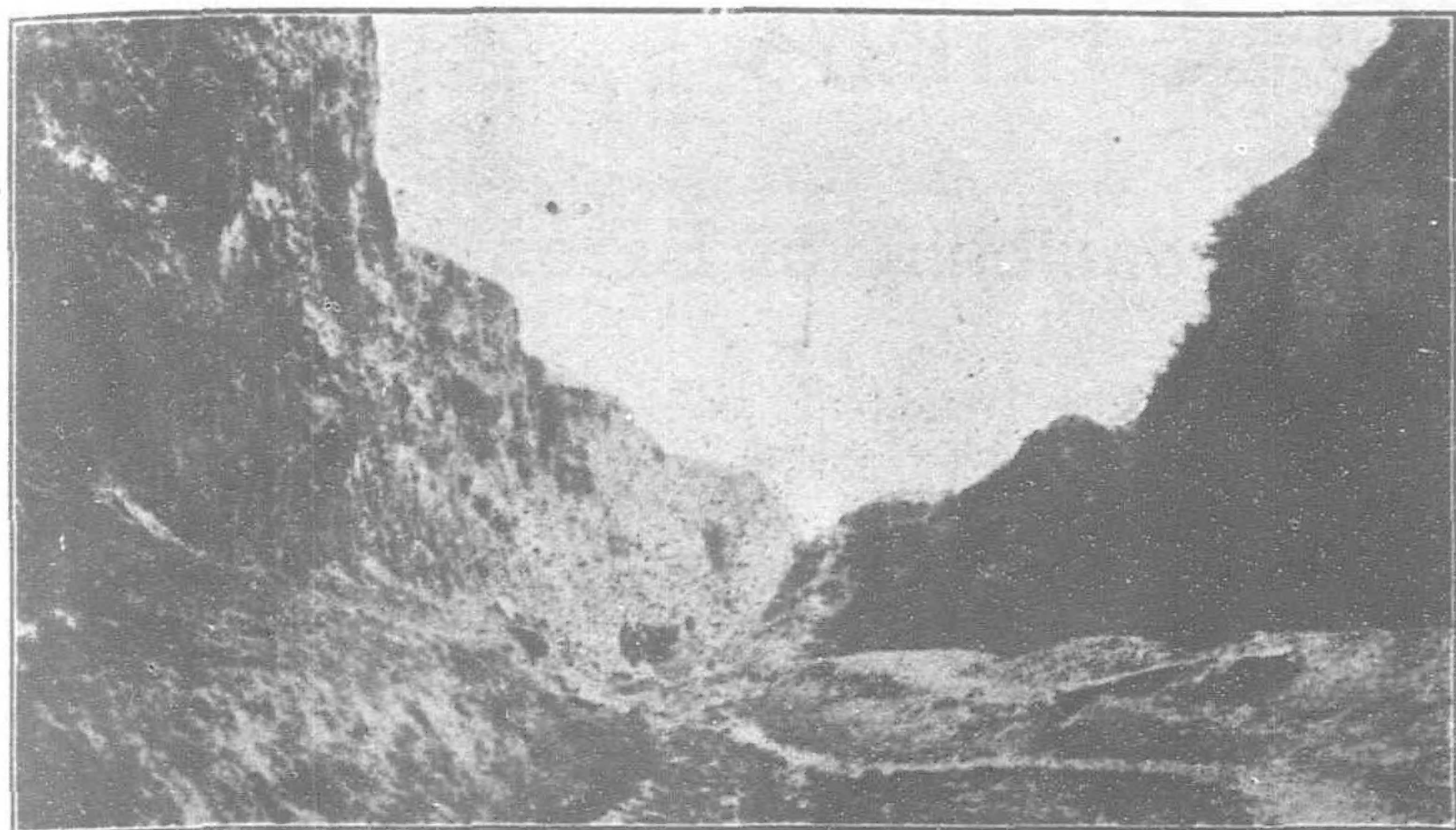
VALLEY FARMING LAND FORMED BY EROSION AND DEPOSITION OF SILT

important trade in lumber. The mountains have now been so largely deforested, however, that it is necessary to go farther and farther back into the heads of the valleys to find large trees.

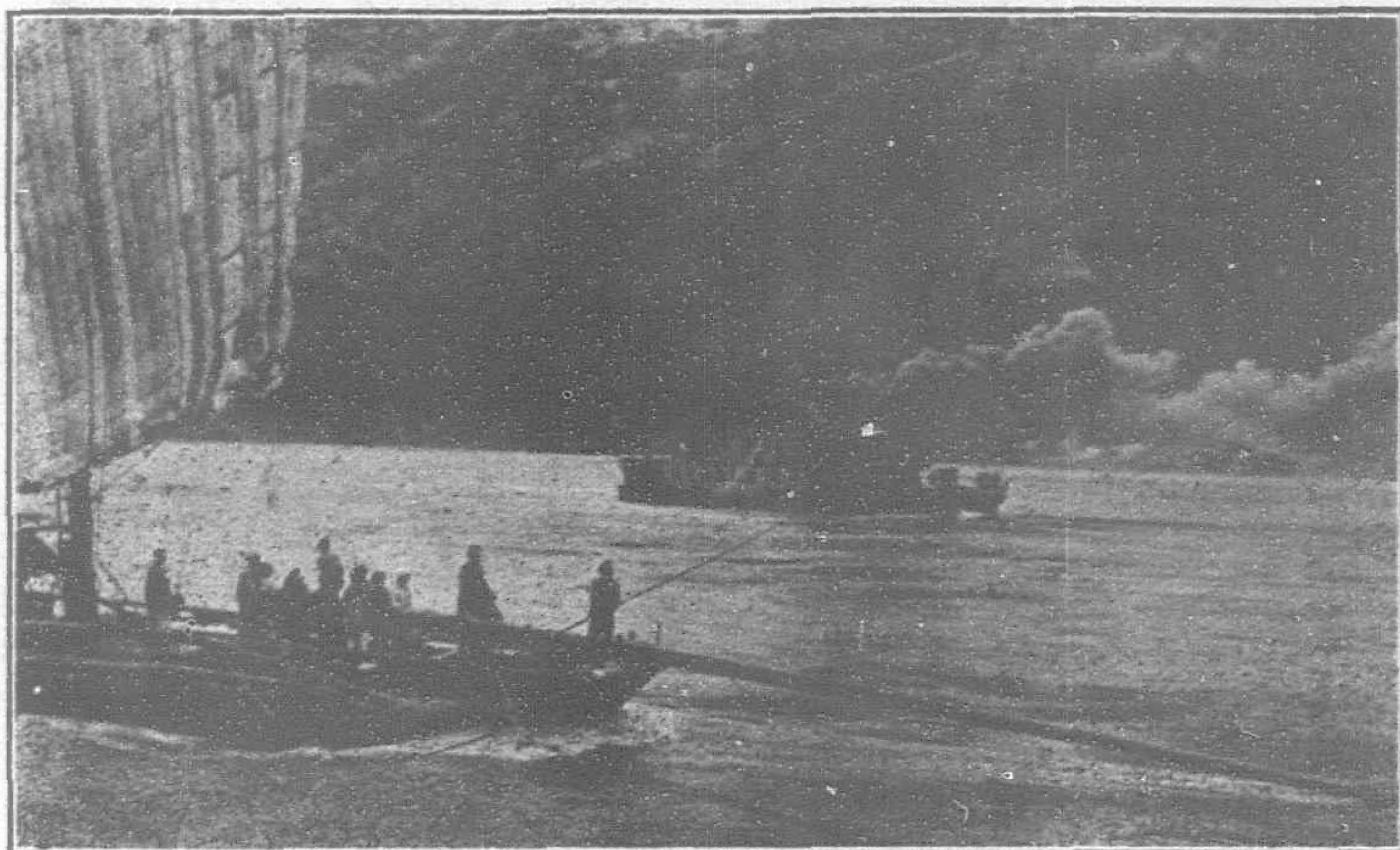
Hence only the more expensive kinds of lumber, such as coffin boards—which are absolutely indispensable, even to the poorer classes—can profitably be brought out. These are often carried for 20 or 30 miles on the backs of coolies—a costly mode of transportation. The smaller trees and brush the mountaineers convert into charcoal, which they carry on their own backs down to the towns along the foothills.

Lack of transportation facilities is doubtless the chief reason why the opium poppy has in the past been widely cultivated in this part of China, although the practice has lately been prohibited by the Government. The advantage in poppy culture was that it could be carried on in small scattered fields and the product was so valuable for unit of weight that it would pay for long-distance transportation across the mountains. The inhabitants of the region themselves were not, however, generally addicted to the use of the drug.

The rainfall of the central mountain region is sufficient to supply the many springs and tributary brooks of which the people have made use in irrigation. The mildness of the climate here permits the growing of rice, and by terracing the hillsides they are able to make a succession of narrow curved basins, in which the aquatic crop may be grown. For the cultivation of rice it is necessary that the fields be completely submerged during part of the season, and so there must be a plentiful supply of water.



NARROW MOUNTAIN PASS



YANGTSE RIVER GORGE

On the larger rivers, such as the Han and the Yangtze and their chief tributaries, boats are successfully used. In fact, the Chinese river boatmen are so skillful in the handling of their high-prowed skiffs that they navigate canyons full of rapids which most of us would consider too dangerous to attempt. The descent of one of these rivers is an easy although exciting experience. The return trip, however, is slow and laborious, for the boats must be dragged upstream by coolies harnessed to a long bamboo rope, which has the advantage of being very light as well as strong. In the many places where the river banks are so precipitous that it is impossible to walk along them it becomes necessary for the boatmen to spole around the cliff or to zigzag from one side of the river to the other to take advantage of every foothold.

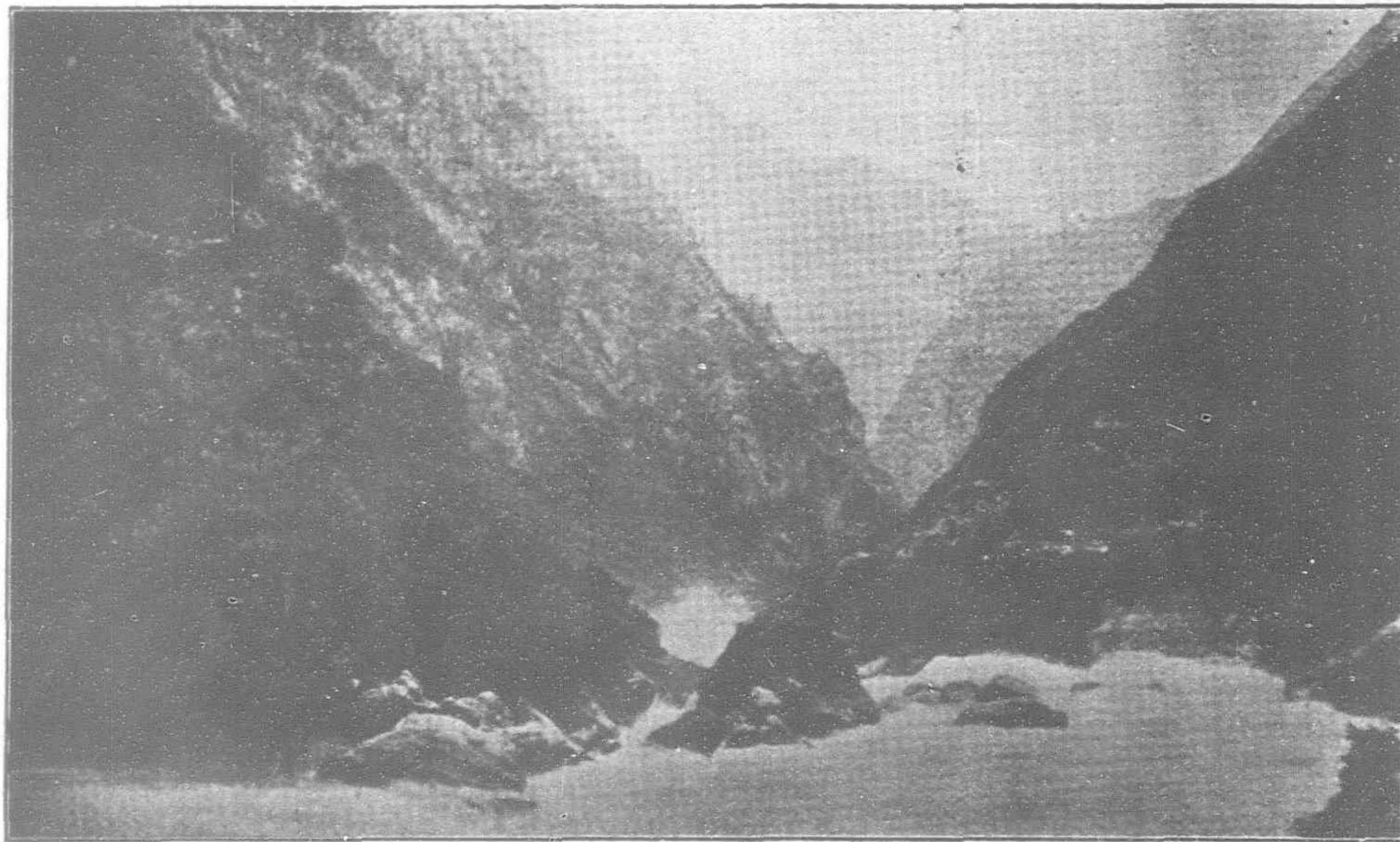
Through the central part of this mountain uplift the great Yangtze River, which in its lower course readily accommodates large ocean going vessels, has carved a succession of superb gorges. In many places the gray limestone walls rise from 3,000 to 4,000 feet above the river, and the stream is compressed into less than a tenth of its usual width. Difficult and dangerous as are these canyons, beset with rapids and whirlpools, they afford the only ready means of communication between eastern China and the fertile basin of Szechuan, which lies west of the Central Ranges.

Without the highway of the Yangtze this great Province, four times as large as Illinois and with more people than all of our States east of the Mississippi River, would be unable to export its many rich products or to enjoy the commerce of outside Provinces and nations. It has been effectually barred off from India and Burma by the succession of high ranges and deep canyons which appear to be due primarily to the great epoch of folding in the Miocene period. Szechwan is a broad basin which has never been depressed low enough to force the streams to level its bottom with alluvial deposits, as in the Yellow River plain to the east; nor does it seem to have been carved by many streams into a rugged mountain country. The soft red sandstone beds which underlie it have therefore been sculptured into a network of valleys with intervening red hills or

buttes. With a climate as mild and moist as that of Alabama and a diversified topography, there is opportunity for many industries and for the cultivation of a great variety of crops. Szechuan leads all the Provinces in the exportation of silk. Here grow the lacquer and oil nut trees and a wide range of field and garden fruits, grains, and vegetables. Ample water for irrigation and especially for rice culture is supplied by the many perennial streams which descend from the encircling mountains.

These uplifted and now mountainous tracts have also served as a barrier to invaders from all directions, so that this has been less subject to wars than almost any other part of China, and hence has been more stable in development. Its inhabitants are among the most substantial and progressive components of the Chinese nation.

We now come to the last of the geologic divisions which were laid out for consideration. From the Szechuan Basin southwest to the confines of India there extends a series of high mountain ranges separated by deep and narrow valleys, all trending in a south or southeasterly direction. Although not so high above sea-level as the mountains north and south of Tibet, these ranges are an even more effective barrier to travel because they are so continuous and the relief is so great. Not only is there no



DEEP GORGE WORN BY RIVER AT TACHIENLU, SZECHUAN, IN SOFT RED SANDSTONE

waterway but there are no wagon roads, and the building of a railroad would be a stupendous and expensive engineering task. Such a road would necessarily involve the making of a succession of long bridges and tunnels. Here, as in the central ranges, settlements are limited to the rare open spots in the bottoms of valleys, and so the population is sparse indeed. The total commerce is very small in volume, because goods must be carried almost entirely on the backs of coolies. The rugged characteristics of the region are evidently the direct result of the compressive movement which produced the tremendous mountain folds, and perhaps are still more due to the renewed uplifts which have permitted the streams to continue the carving of their deep gorges. This part of China is geologically very young, and to quote the words of the distinguished old geologist of California, Joseph Le Conte, "the wildness of youth (here) has not been tempered by the mellowness of age."

JAPAN AND CHINA

The Genesis of the Demands: the Responsibility of Baron Kato

(By Britannicus)

Japan, August 1.

Those of us who have some knowledge of Japanese politics have followed recent events in China with much interest. We have not been surprised that British communities in the neighbouring Republic have risen up in astonishment at the apparently tortuous course of Japanese politics in the country in which they reside. They have had good reason for doing so. But in fairness to the Japanese it is right that certain explanations should be made, explanations that palliate the recent occurrences, though they by no means excuse them.

Many of us who know Japan are of the opinion that the Japanese Government have no fixed policy in regard to China. Nor does there seem to us to be any individual statesman in Japan possessed of convictions as to the line Japan ought to follow in China—that is to say any revealed statesman with convictions founded on knowledge and understanding of the situation. Every politician in Japan thinks Japan ought to do certain things in China, but the opinions of most of these are based on blissful ignorance of outside considerations, such as the feelings of the Chinese and the interests of other Powers.

Recent events justify this conclusion. The Japanese Government presented to China a series of demands, which were drastically modified in consequence of foreign disapproval. It may be fairly said that a section of these demands, if conceded, would have conferred upon Japan a large measure of political control over China. If it had been the intention of the Japanese seriously to pursue a policy involving so important and far-reaching a result they ought before adopting it to have considered their relations with other countries and their own power in the Pacific. Either, therefore, the policy indicated was never seriously meant; or, if it was meant, an attitude was foolishly taken up which, when it came to the point, was recognised to be incompatible with existing engagements and not justified by the military power of Japan. In my opinion the Japanese Government did not themselves fully realise the significance of their demands upon China, while those members of the Government who may have realised it did not expect to be successful, except in so far that something might be snatched at an opportune moment. But whatever the motive, there is indicated the lack of fixed policy. Japan wants many things in China, but she cannot be said to have a policy until her wants have been crystallized into something concrete and practical. What was demanded from China the other day was neither one nor the other, or a decidedly ignominious retreat would not have been necessary.

Incidentally there has been manifested an astonishing lack of statesmanship. Japan has obtained some things that were necessary to her, but at the expense of a check to her trade, of doubling Chinese fear of her, and of arousing foreign suspicion of her motives. What she needed and what all the world would have regarded as reasonable, she might have obtained with much less offence to China, and without arousing foreign suspicion. There is no doubt that Baron Kato is mainly responsible for the mistakes made. It is understood here that the demands were compiled from statements of Japanese needs, presented by all departments when it became obvious that the moment was opportune for action, and included things permanently in the mind of the Foreign Office, such as the extension of the leases. Thus while it may be true that the demands were an expression of the wishes of the country in general it was the business of Baron Kato as Foreign Minister to formulate them. This he did apparently without consultation with Cabinet or Genro. When formulated the demands were approved by the Cabinet and the Genro. But it is well known that some members of the Cabinet did not understand what their consequences might be, simply because of their ignorance

of foreign politics. They did not realise for instance that Great Britain would object to Japan obtaining a considerable degree of political control in China. It was a new aspect to them that Japan's rise in the Far East has been marked by a closing of the door successively in Formosa, Japan itself, Korea and partly in Manchuria, and that Great Britain with her large trade, and enormously predominant established interests in China could hardly be expected to contemplate with satisfaction the arising of a state of affairs which would give Japan further opportunities for shutting doors.

I am labouring this point with the object of showing that the demands upon China were not the outcome of a calculated policy on the part of the rulers of Japan. I place no limits at all on what the Japanese, from the senior Genro down to the poorest elector, would take from China if they were not restricted by circumstances. But it is another thing to suppose that Japan, in the person of its responsible Government, made a deliberate and Machiavelian attempt to "jump" an enormous claim in China. It certainly does look as if such an attempt was made, but I do not believe it was seriously meant, and in support of that belief there is the fact that the dangerous demands were withdrawn when it came to the point.

Various explanations offer themselves, as to why an obviously false step was taken. I feel sure the mistake would never have been made if there had been an Ito alive in Japan or if the Genro had not been in their dotage, collectively and individually. I am satisfied that whatever amount of blame has been incurred ought to be apportioned mainly to Baron Kato. He is the only strong man in the Cabinet, and probably the only one who has a real grasp of foreign politics. He is unpopular throughout Japan and with his colleagues, because of his brusque manners, and his generally European ideas. He leads his party through force of character, not through popularity. He deems himself supreme in his own department, and takes little interest in domestic affairs. In the matter of the demands, I believe, everybody else followed him like sheep. There are certain excuses to be made for him. For instance, it was reasonable to ask from an Oriental country far more than it was expected to obtain. Further, in these days in Japan, when the Anglo-Japanese Alliance is openly criticised and Baron Kato commonly accused of being merely a tool of the British Government, it was not unreasonable for him to pursue a line which gave the impression that he was acting independently of the wishes of the British. Then there is the insistent demand in Japan for a forward policy in China, and with an election pending, it was not unreasonable for him to make a theatrical display of activity in China.

Where Baron Kato went wrong was in including in the demands things that were bound to arouse foreign opposition, and in trying to obtain them behind the backs of the Powers interested. But even in this respect there is an excuse to be made for him, though not a very creditable one. But within this excuse is to be found what I believe to be the key to the recent proceedings in China. It is the fixed conviction of everybody acquainted with Far Eastern affairs—from the Far Eastern point of view—that since the Russo-Japanese war the British Government, where British interests have been concerned, have never been frankly dealt with by Japan; and that if the British diplomatic representation in Tokio had been more intelligent the Foreign Office in London would have had a better understanding of Japanese methods. But I expect the Foreign Office, say since the annexation of Korea, has been under no delusion as to the straightforwardness of the Japanese, although no sign of this disillusionment has ever been outwardly shown. But the *naïveté* of the Japanese is such that they have supposed that the British were permanently shortsighted, and that it would always be easy to throw dust in their eyes, and to explain afterwards what happened behind the

dust. In my opinion Baron Kato traded on the belief that he could play any old game on the British. Hence, tacked on to the comparatively legitimate demands on China, were as pretentious a set of proposals as were ever formulated. So pretentious were they that they were not fit for communication to the British or any other Government. But Baron Kato, ignorant of China and Chinese ways, and employing Dr. Hioki, equally ignorant, foolishly tried to rush the Chinese all of a sudden into acceptance. He hoped to get some of Group Five, and to make some of what he got good thereafter. Judging by past experience of the British, he doubtless thought to himself, there would be no difficulty in explaining things away to them. America would have no ground for complaint if the British were satisfied. No other Powers were sufficiently interested, especially at such a crisis in their own affairs, to care what Japan did in China. It is evidence of Baron Kato's ignorance of China that he did not expect that the Chinese would let the cat out of the bag. To everybody out here, it is obvious that the Chinese could never have observed secrecy, for it is always their way, as it is the way of all Orientals, when being harrassed by one Power to tell the trouble to all the others.

Further in support of the theory that Japan has no fixed policy in regard to China is the attitude of the country during the negotiations in comparison with its attitude since they were concluded. The Press eagerly welcomed the evidence of a forward policy in China. Its only criticism of the Government was that they were not strong enough in dealing with the Chinese. It was urged that force should be applied in order to obtain what was wanted. As we know, troops were actually sent to China, and others were mobilised in readiness, while the fleet was active on the China coast. In the midst of all this hubbub the elections took place, and the Okuma Government was returned to power with an overwhelming majority. Clearly the country subscribed to what was being done.

But what has been the result? Japan is now disgusted with its government for getting into bad odour in China and for embroiling it with foreign Powers. The most determined efforts have been made to get the Okuma Government out, and particularly to force Baron Kato to resign. The Government have been saved by the proximity of the Coronation, but it seems the universal opinion that they will have to go eventually, because of their mishandling of the opportunity in China. In other words Japan does not know what it wants. It is cross with the Government, not because of the demands, which are not really understood, but for getting the country into trouble.

To my mind it is very valuable to establish—as I have endeavoured to do—that with certain known exceptions Japan has no clearly defined aims in China, and particularly to establish that the recent demands were not the outcome of a deliberately adopted policy. If the latter were the case, the inclusion in the agreement with China, of the stipulation that Group Five was only left over for future consideration, would be ominous of her intentions in the future. But I believe that this stipulation was inserted merely to save face and that there is no intention to resuscitate the obnoxious demands in the near future.

In the mind of Japan there are vast but vague expectations of future economic and political conquests in China. The important thing from the foreign point of view is that these remain indeterminate, and that Japan recognises that, financially restricted as she is, she cannot realise them in opposition to the wishes of the rest of the world.

DR. WELLINGTON KOO

Mr. Chen Loh, Chinese Minister to Mexico, having been appointed Resident-General of Autonomous Outer Mongolia, President Yuan Shih-kai on July 11 appointed as his successor Dr. V. K. Wellington Koo. In the capacity of Senior Councillor of the Chinese Foreign Office, Dr. Koo rendered valuable and important services to the Government, and his elevation to the rank of a Plenipotentiary is acclaimed as a thoroughly well-deserved recognition of conspicuous merit. Dr. Koo left China for America early in August.

The new Minister to Mexico was educated at St. John's College, Shanghai, Cook Academy in New York State, and



DR. V. K. WELLINGTON KOO
Chinese Minister to Mexico

graduated from Columbia University, New York, with the degree of B.A. in 1909, after which he took up post-graduate studies, qualifying for the M.A. and Ph.D. degrees and specializing in International Law and Diplomacy under Professor John Bassett Moore, the foremost American authority on these subjects. Dr. Koo wrote much in the United States and is the author of a now well-known monograph, "The Status of Aliens in China."

When Mr. Tang Shao-yi was sent as Special Ambassador to Washington in 1908, he was instructed by the President, at that time Grand Councilor of State, to keep an eye on the best students in America. Mr. Tang on his return recommended Dr. Koo as the brightest of the Chinese students then studying in the United States. In 1912 the Government repeatedly wired to Dr. Koo requesting his immediate return to China to serve under the President as his English Secretary. On his return he was at once appointed Secretary of Cabinet as well as Secretary to the President. On the Premier's resignation he was appointed Secretary of the Wai Chiao Pu and later promoted to be Acting Councillor and then Councillor of the Ministry. In that capacity he ably assisted the chiefs of the Board in all important questions.

The President has frequently sent for Dr. Koo to attend the palace Conferences. He is one of the most conscientious young public servants in the Government service and enjoyed the confidence of the President and the Minister for Foreign Affairs. Dr. Koo has also served on many important Commissions during his tenure of office in the Wai Chiao Pu. He was Chairman *pro tem* and member of the Treaty Study Commission, the Hague Peace Conference Commission, the Joint Commission of the Ministries of Justice and Foreign Affairs to study the Mixed cases between Chinese and Foreigners, and the 1911 Revolutionary Claims Commission. He served also on the Commission to devise means for the Reform of Customs Duties and on the Commission to draft a Constitution for the Republic. He was awarded the Third Class Chia-ho Decoration in 1913, and Second Class of the same order just prior to his departure for America.

PHILIPPINE WOODS FOR THE CHINA AND FOREIGN MARKETS

[BY W. F. SHERFESEE, DIRECTOR OF FORESTRY, PHILIPPINE ISLANDS]

Less than two days steaming distance separates the Philippines from China; and yet it would be difficult to find a greater contrast in such close juxtaposition anywhere else in the world. China we find teeming with a dense population of about 400 million souls—and a scarcity so great as to be almost a complete lack of the forest resources upon which the material welfare of the industrial advancement of the people must so intimately depend. In the Philippines we find a comparatively scanty population and abundant forest resources. In fact, so prodigal has nature been with her gifts in this respect that according to reliable estimates the annual growth in the Philippine forests is nine or ten times as heavy as the amount of timber cut and utilized under license. On the one hand, then, a huge and vigorous society is hampered on every side by the lack of wood for fuel and other domestic purposes and for industrial use. Only a short distance away another and widely different society is handicapped through lack of money to develop its huge but inadequately utilized forest resources. The one country must have timber and other forest products and is willing to pay for them and the other country is equally anxious to sell. The logical deduction is obvious. Both countries would profit enormously by the opening up of a large market in China for the excess forest products of the Philippines. We in the Philippines must utilize our forests to the limit of their productivity, but in such a manner that the forests as a whole will not be impoverished or destroyed, and we must look to China as one of our principal markets for our surplus lumber.

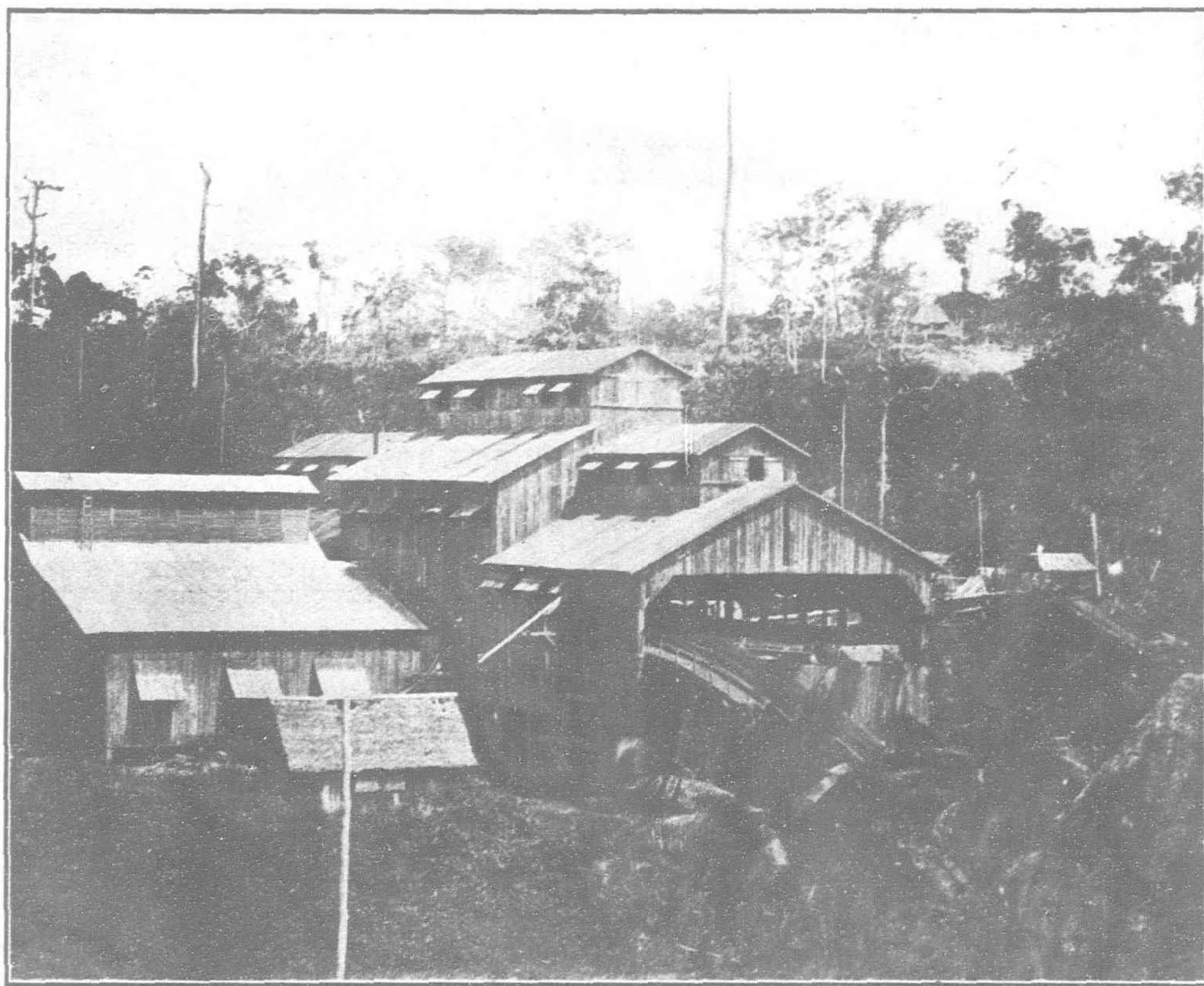
It is, therefore, most important that the lumber dealers and users in China should know of the opportunity which awaits them in the Philippines for obtaining the products they need; and it equally behooves the Philippine lumber producer to study the market conditions in China so as to enable him to meet the demand which undoubtedly exists.

In establishing a close market relationship between China and the Philippines we are confronted at the outset with the very great handicap of difference in language, difference in customs, difference in units of measurement and difference in needs;—and at first at least it is difficult for us to understand each other. At present also, owing to the European war, the Philippine exporter finds great difficulty in securing transportation at a reasonable price; but none of these difficulties or others which will possibly occur to the reader, are insurmountable if they are taken up actively and vigorously and if sound business methods and judgment are applied to their

solution. The principal purpose of this article is to set forth for the lumber dealer or user in China the opportunity which the Philippines present.

More than 99% of all standing timber in the Philippines is owned by the Government and administered under a license system. The forests of the Philippines cover approximately 40 million acres or about 60,000 square miles. This is equal, roughly, to the area of the State of New Mexico; two thirds or about 40,000 square miles are covered with virgin forests, the remaining 20,000 square miles being covered with so-called "second growth" forest, much of which is of value only for local or domestic use. The supply of timber is, as has been stated above, much greater than will probably ever be needed for local consumption. Moreover, the number of species is so great and their qualities so varied that wood consumers will be

able to find here one or more kinds of wood excellently suited for any of the many uses to which wood is ordinarily put. In fact, probably few countries of the world possess in an equal area so large and varied a supply of hard, beautiful and durable woods as are found in the Philippines. Up to the close of the last century there was little definite information concerning the qualities, and still less of the quantity, of most of the Philippine woods, with the exception of a few of the finest species such as narra, camagon, ebony, acle, ipil, and a few others. During the Spanish regime the forests were explored only to a slight extent except in the more accessible portions of the best known islands



A MODERN SAWMILL IN THE PHILIPPINES

of the archipelago. Timber was cut almost only to supply the local demand and the exports were restricted to the strong, durable timbers sold to China for purposes of naval construction and of occasional small lots of cabinet woods sent to Spain or other European countries. Logging operations were primitive in the extreme. A few small steam and water power mills had been established, but the equipment would be considered woefully antiquated and inadequate by a lumberman of to-day; and the total output from such mills throughout the entire archipelago was much less than that produced in the aggregate by the laborious whipsawing method. For hauling logs out of the forest animal or man-power alone was available and, even under the cheap labor conditions which then existed, it was not practicable to operate for a greater distance than three or four miles from water. Hence only the finest and most expensive woods were felled and logged and thus during the early days of the American occupation there arose the erroneous idea, which

still exists to a certain extent at present, that the commercial woods of the Philippines are so scarce and are so scattered among a mass of "weed" trees that logging on a modern scale and the production of timber in large quantities are impracticable. Nothing could be further from the truth; for although it is true that it must be said of almost all of the finest cabinet woods that they are "widely distributed but nowhere abundant," it is equally true that about 70% of all Philippine timber belongs to the dipterocarp family, which is generally found in stands which are almost pure from the lumberman's point of view. The largest individuals of this family reach two hundred feet in height and some specimens have a diameter of seven feet. This family is by far the most important as it furnishes the main bulk of the timber cut in the Philippines. About a dozen botanically distinct species furnish probably 80% of the entire cut. From the standpoint of the lumberman, however, this number can be reduced to three groups, namely, the lauans, apitongs and yacals.

Tropic Climate Destructive of Woods

Climatic conditions in the tropics are such that wood, as a whole, is a much less durable material than in the temperate zones, and thus a wood which is regarded as of second or third rate in the tropics may give excellent service and show up high in the scale of comparison when exported to colder countries, where it is less exposed to insect attack and to decay. Before the advent of the Spaniards the people of the Philippines were familiar with the more durable kinds of wood and continued to use them for permanent construction, such as for houses, furniture, tool-handles and similar uses which required woods comparatively insect and weather proof. The Spaniards followed their example. Many of these woods, in fact a large proportion of the best species, grow scattered on the coast and lower mountains, while the woods found in immense quantities in the dense high forests of the interior are, generally speaking, of the lighter, softer and less durable kinds. In the old days these were looked down upon and were used only where cheapness and ease of working were of more importance than strength and durability. It probably never occurred to either the early Filipino or Spanish lumberman that such woods could ever form a valuable article of export. The largest trees of these abundant species were rarely felled except for the purpose of making dugout boats, due to the extreme difficulty they presented in logging and sawing without the mechanical equipment of to-day.

Since the American occupation the situation has changed radically, and practically all the forests of the Philippines have been explored and described, at least on a broad scale, while intensive studies and estimates have been made over many of those portions of the archipelago which promise to be most important from the lumberman's point of view. The stand of timber in the Philippines is roughly estimated to be 200 billion board feet, of which probably 140 billion board feet belong to the dipterocarp family mentioned above.

With certain notable exceptions the abundant timbers of the dipterocarp family are not very hard, nor under severe weather conditions very durable, but they form heavy stands over large areas, thus lending themselves readily to logging by steam. They possess beautiful coloring and being generally somewhat cross grained they have very commonly a "ribbon grain" similar to that of quarter sawn mahogany. Such quantities have been produced by the larger operators during the last ten years that they are now appreciably cheaper in the markets of the Philippines than in the Spanish days in spite of the fact that the popular estimate of their qualities and uses has enormously risen. On the other hand the very hard and durable woods for the finest construction purposes and for cabinet work have increased but little in quantity of output and bring prices but little lower and in some cases even higher than formerly.

Being abundant and easy to work the increased production of the lauans,—the most representative group of the dipterocarps (in fact the dipterocarp family is commonly referred to as the lauan family) has brought about an increasing demand and they have been used to a very large extent for general construction,

interior finish and furniture, and have been exported in quantities very much in excess of those in which any Philippine woods had previously been shipped to foreign countries.

Classes of Philippine Woods

Taking the Philippine woods of importance for export as a whole we can consider them as falling into four main classes, the yacals, the apitongs, the lauans, and the woods belonging to the leguminosae or so-called "locust" family of the temperate zone.

Yacals.—This group comprises trees locally known as yacal, harig, mangachapuy, and dalingdingan. The timbers are hard and durable and are much more plentiful than the other very durable commercial woods of the Islands.

Apitongs.—The apitong group comprises timbers known as apitong, panao, hagachac, and guijo. The first three are marketed under the name of apitong. Guijo is generally considered somewhat superior. Well-seasoned timbers of this group weigh between 40 and 60 pounds per cubic foot.

Lauans.—It is in this group that the main wealth of the Philippine forests lies. It comprises timbers locally known as white lauan, red lauan, almon, bagtican, mayapis, tiaong, and tanguile. For the sake of simplicity, they may be divided into two classes, namely, the white and red lauans. Export grades of the red lauans are used in Europe and America as substitutes for mahogany, and are frequently sold as such. While not so hard and durable as mahogany, lauan has a beautiful grain and permits of a very fine polish.

The main bulk of the forests produce timbers of comparatively few kinds and in some instances approach pure stands of one or two grades. It is estimated on an average that 70 to 80 per cent of all the dipterocarp forests will yield timbers that belong to the groups described above.

Leguminosae.—Next in importance to the dipterocarp family are the leguminosae, or locust family, to which a number of the commercially important cabinet woods of the Philippines belong. Among the principal representatives of this family are narra, tindalo, ipil, supa, acle, and banuyo. No finer hardwoods are found anywhere in the world.

Stand.—The average stand in the virgin forests of the Philippines may be roughly estimated to run 6,000 board feet per acre and over. On some of the tracts now being worked under long-term license arrangements (or concessions as they are popularly called) the stands run between 15,000 and 35,000 board feet per acre. Stands of 45,000 to 60,000 board feet per acre are not infrequent, principally at elevations between 800 and 1,200 above sea level.

Export timbers fall roughly into four principal classes: Woods for interior finish and furniture, cabinet woods, woods for special uses, and heavy construction timbers.

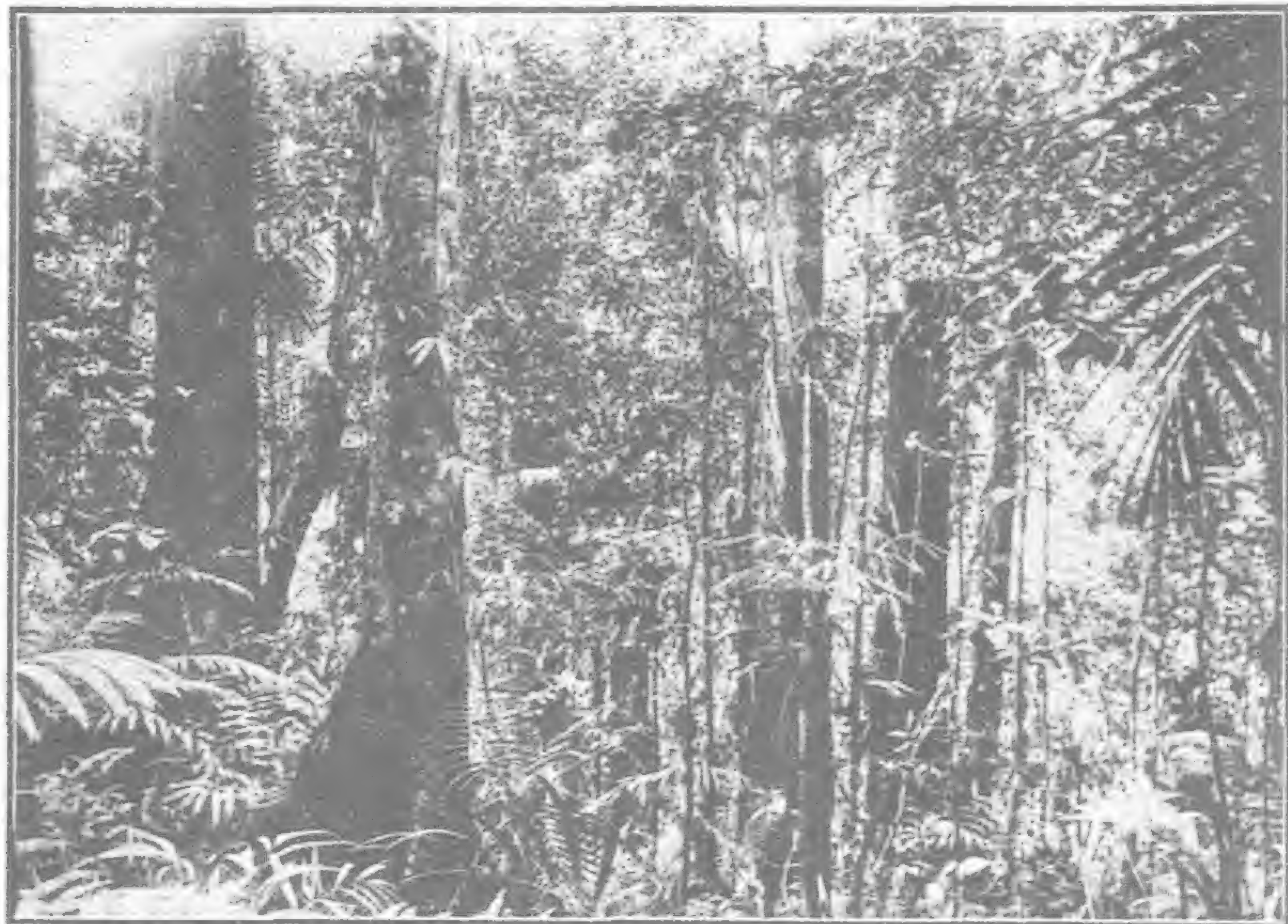
Interior Finish and Furniture Woods

The prime requisite of a wood for these purposes is that it be at least fairly abundant. Also, it must be not very difficult to work and to finish, of good size, and last, but not least, of pleasing texture and color. All of these requisites are fulfilled by the woods of the dipterocarp (lauan) family. This family occupies the place that the conifers do in the North Temperate Zone, but possesses a wider range of color, hardness, and other qualities. The lauan group of dipterocarps contains the greatest amount of timber especially fitted for interior finish and furniture. Tanguile, red lauan, and white lauan are obtainable in great quantities, have a fine ribbon grain when quarter-sawn, and in texture and color the first two resemble true mahogany and its substitutes very closely. White lauan differs from them only in color, being white with a very pale grayish-brown tint. It is pretty in natural finish where a light color is desired and, on the other hand, lends itself very well to staining. Almon, a very pale red lauan, is similar to white lauan as regards stains.

The other woods of the same family, guijo, apitong and yacal are also abundant. This fact and their greater hardness enable them to fill a demand for flooring in place of oak, red beech, maple, and other American woods which are yearly becoming scarcer. Guijo is light ashy brown to reddish brown

and apitong is somewhat darker. Finished with wax or varnish, they range from reddish brown to dark chocolate. Both are hard and of rather fine texture. If a very hard wood is desired for flooring, yacal, the hardest and heaviest of the dipterocarps and the most abundant of the hard, heavy, and durable woods in the Philippines, will find a place.

There are several woods of other families which, though not as abundant as the lauans, are still to be obtained in sufficient quantities to supply industries that do not require many millions of feet per year. Such are lumbayao, pagatpat, and nato.



A TYPICAL SCENE IN A PHILIPPINE DIPTEROCARP FOREST

Lumbayao is similar to red lauan in appearance, but is slightly harder and tougher and has a more conspicuous flake grain when quarter-sawn; nato is of similar color and texture, but of very homogeneous grain; pagatpat also is even-grained, but of a rich dark-brown color.

In the Philippines many other hard, durable, and beautifully colored woods are also frequently used for flooring and interior finish; for the export trade, however, these woods, on account of their beauty, comparative scarcity, and higher price, should rather be classified as cabinet woods.

Cabinet Woods

Of these the Philippines possess such an astonishing variety that it is difficult to give any idea of them in a short article. Foremost among this class on account of their large size, beautiful color, and grain and durability are the woods of the narra (or locust) family—acle, banuyo, ipil, narra, supa, and tindalo—all of which would delight the eye of every maker of fancy furniture and cabinetwork. A dining-room set, a piano, a billiard table, or any similar piece of furniture made from one of these, would attract attention at once no matter what comparison it might have to bear with other aristocrats of the lumber world. To attempt an enumeration of different classes of cabinetwork, naming for each one the various Philippine woods available would necessitate much unnecessary repetition. Perhaps the easiest way to give the cabinet-worker a notion of what he may demand (and obtain) for his purposes is an enumeration of some of the better-known woods roughly classified by colors: Black—ebony streaked or mottled with red; brown or gray—camagon, ata-ata, bolongeta (the Philippine persimmon); dark brown—dungen, ipil, mancono, pagatpat, pahutan; reddish brown—apitong, batete, betis, catmon, guijo, nato; red—amuguis, bansalaguin, calantas, nato, palomaria, sibukao, tabigi, tucangcalao; grayish-banawi, macaasim, tabao; yellow—alintatao, bancal, baticulin, malacadios; pale straw color, creamy or nearly white—kayutana, lanete, miao, white nato, molave. It must not be thought that the foregoing list is compiled with a view to color alone, any and every wood, good, bad, or indifferent, being dragged in to fill up; on the contrary, those named are all good woods, rarely attacked by boring insects, and not generally subject to discoloration except in the case of such

light-colored woods as are easily stained by too slow or otherwise inefficient seasoning. In fact, the list could be doubled by including other woods used, on account of their varied color and grain, for musical instruments, fine cabinetwork, sculpture and carved articles, canes, hilts and sheaths for weapons, inlaid and mosaic work, desk and toilet novelties, picture frames, etc.

Special Uses

For bowling balls, bearings, stern shaft bearings, etc. mancono has been used successfully. For the first-named purpose, dungen has also been found good. Bansalaguin, alupag, malabayabas, and tiga, all of fine texture, difficult to split, and very heavy, are recommended for experiment. For such articles as dumb-bells, paper-weights, etc., requiring weight but not necessarily so fine and tough a texture, not only these, but a considerable number of other very hard and heavy woods are available.

For tool handles and other parts of tools, there are generally required woods that are either hard or tough or both. Chisel and hammer handles and mallets especially need to be hard, tough, and difficult to split; for these agohe, betis, calamansanay, dungen, guijo, malugay, palomaria, and yacal can be supplied; two of these, guijo and yacal, can be obtained in very large quantities, while the others occur in quantities sufficient to make tool handles, if not by millions, at least by thousands. Most of these, as well as many others equally hard or harder but not so tough, would supply turned and shaped handles such as grips and butt plates for braces and drills, plane and saw handles, plane bodies, scratch gages, scraper and drawknife handles, and hollow-tool handles.

For long agricultural tool handles, in which hardness is less essential than toughness and difficulty of splitting, guijo, the hardest grades of lumbayao, malugay, mangachapuy, and yacal



DRAGGING LOGS OUT OF THE PHILIPPINE FORESTS BY MAN-POWER. THESE METHODS ARE RAPIDLY YIELDING TO MODERN MACHINERY

would make excellent substitutes for ash. The same species, with the exception of lumbayao, would make good axe handles.

For wagon tongues and other vehicle stocks, hubs, spokes and felloes, an excellent material is found in guijo; it is not very heavy, but tough, difficult to split, and can be obtained in any size and quantity desired. Malugay, which is a little lighter, but equally tough, is not as abundant as guijo, but can still be supplied in fair quantities.

The cigar-box lumber *par excellence* of the world has for many years been the "Spanish cedar" of tropical America; in calantas is found a perfect substitute, so nearly identical in color, texture, and odor as to be almost indistinguishable. It is the only native wood used in Manila for high-grade cigar boxes. For cheaper boxes several of the lauans and nato are used.

Shuttles and spindles must be hard, rather tough, and resistant to abrasion. For these purposes a considerable supply of sapwood of the trees of the camagon (persimmon) tribe could be furnished. Calamansanay and malabayabas are also recommended for trial in shuttles.

Heavy Construction Timbers

A number of large trees furnish hard, strong, and very durable construction timbers; and in this regard three species are worthy of special mention as furnishing magnificent posts or beams for all kinds of heavy structures, namely, yacal, pagatpat and ipil. Allied to heavy construction is the use of timber for railway ties, durability and strength being the two qualities required. For this last purpose not only the three species above named are available, but at least twenty others are found, which, although they are not large enough or are not found in sufficient number to yield a great supply of large timbers, still can furnish tie material. This statement refers, of course, to ties used without any preservative treatment. For treated ties, both the number of kinds and the supply available are much greater; practically all the lauans are very abundant and of great size and are probably susceptible to impregnation. They are about as strong as the medium-grade conifers, being less hard and heavy than Georgia pine, but somewhat stronger than the softest conifers. Beside the lauans, there are two harder woods available in great quantities, namely, guiyo and apitong.

Obtaining a Tract of Timber

The public forests of the Philippines are not sold, but are developed under a license system. Small operators usually work under ordinary yearly licenses for definite small areas. Exclusive licenses, or concessions as they are popularly called, are generally in the form of a twenty-year exclusive license to cut and extract timber and other forest products from a specified tract. The land itself is in no way affected by such a license, merely the timber and minor forest products are included.

When a lumberman seriously considers an investment in the Philippines he himself or an experienced representative should state to the Director of Forestry approximately the extent of the investment he contemplates. He will then be given information about several tracts which promise to answer his needs, and arrangements can be made for an experienced forester to accompany him over the tracts in question so that he can size up conditions for himself. All maps, estimates, and other detailed information which may have been collected on the tract will, of course, be placed at his disposal, and he can count upon the heartiest governmental co-operation and assistance in making a success of his enterprise. It should be understood, however, that in no case does the Director of Forestry guarantee the correctness of the estimates or other data which he furnishes. These are given to the applicant for what they are worth, and in every case he is advised to take such steps as may be necessary to satisfy himself as to whether or not they are correct. If the lumberman then decides to apply for the concession, he makes a formal application in writing to the Director of Forestry for an exclusive twenty-year privilege for the tract he has selected. His application is then forwarded by the Director of Forestry with recommendations to the Secretary of the Interior, who may then approve the issuance of an exclusive license, if he decides that such a course is in the public interest. For an area of more than 1,000 hectares (approximately 2,500 acres) proposals for bids to secure the desired privilege are published in the Official Gazette and other papers. At least six weeks intervene between the appearance of the first advertisement and the opening of the bids, but in order to give interested parties in the Philippines ample time to correspond with their principals in Europe or America this period is usually extended to about four months. The advertisement states the amount of capital which must be invested within a given time, the minimum cut during the several succeed-

ing years, together with certain requirements regarding logging and milling equipment, etc.

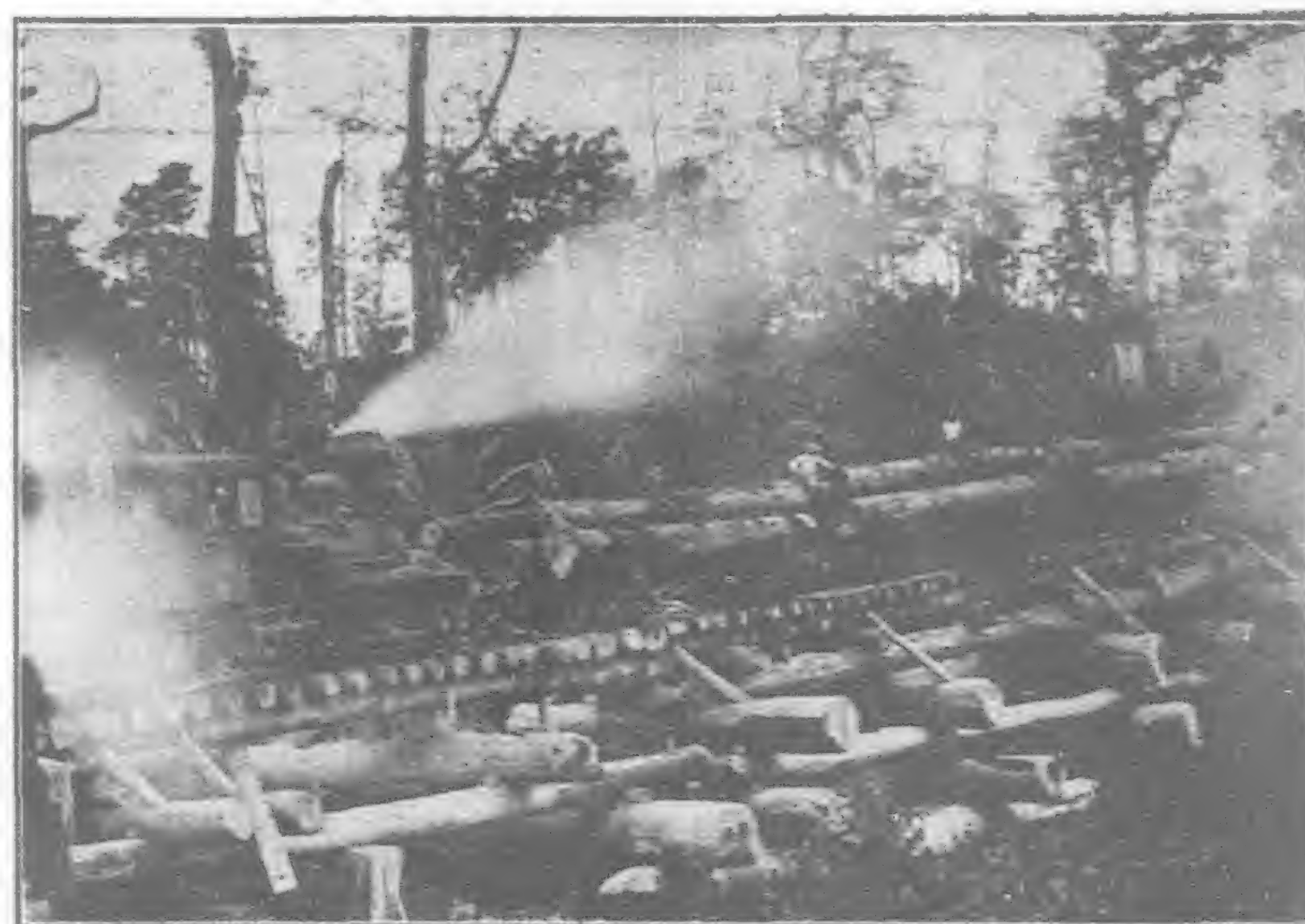
Formal bids are finally submitted and the license will be granted to the bidder who gives the best assurances of developing the tract most thoroughly and promptly. The right to reject any



FILIPINOS WHIP-SAWING LUMBER IN THE PHILIPPINES. A METHOD RAPIDLY YIELDING TO MODERN MACHINERY



HAULING LOGS BY CARABAO. THE FOLLOWING SHOWS HOW SUCH METHODS ARE BEING SUPERSEDED BY STEAM



STEAM LOGGING IN A TIMBER CONCESSION IN THE PHILIPPINES

and all bids is expressly reserved. The areas thus granted as concessions are generally of sufficient extent to permit operations for a considerably longer time than the period for which they are granted, and thus the logger and millman in making his investment may expect to operate not merely for twenty years, the limit expressed in his license agreement, but almost for an indefinite period. In fixing the annual production there is taken into consideration so far as possible the amount of overmature timber on the stand and the amount of annual increment, with the object of rendering the investment a permanent one instead of merely permitting the operator to strip and abandon the area he holds. In preparing regulations under which the operator is required to work, first care is given to the future condition of the area in order that the land after logging may be potentially as valuable as before, and no consideration of immediate profit is allowed to interfere. Nevertheless, the logger in the Philippines will find that in comparison with similar conditions elsewhere he will have few restrictions to contend with, and in practically no case are these such as seriously increase the cost of his operations. It is to permit such permanent use of the land that concessions are granted over such large areas, often consisting of 100 square miles or more. The Philippine Government sells its timber cheap—at half and less than half the stumpage prices asked for similar woods in neighbouring tropical countries. It costs nothing to secure a concession—evidence of good faith is all that is required. It may be mentioned that the stumpage is collected not in advance, but progressively as the timber is cut.

Sawmills

At present there are about 70 sawmills of all sizes and descriptions operating in the Islands, about 12 of which can be compared to the average modern sawmills in the United States. The largest sawmills are located on timber concessions, while the others are operated under short-term licenses. The total cut of the mills of the Philippine Islands is about 65 to 70 million board feet per year.

Transportation

The commercial forests are found either along the coasts where the timber can be skidded directly to the beach and loaded in suitable harbors, along navigable and floatable rivers where it is skidded directly to the water and floated or rafted down stream, or at a short distance inland where short logging railroads are advisable or necessary. For such timber as is close to the beach or large rivers, logging is easy and cheap, requiring but little capital. In these forests there are already a large number of operators, most of whom cut only small quantities of timber. The shipping of timber to the market from isolated sawmills in the Philippines involves considerable difficulty and expense and the lumberman who does not own his own interisland transportation is decidedly handicapped. Few interisland steamers are adapted for carrying lumber, and freight rates are high and sometimes prohibitive. A company operating on a large scale should therefore provide its own means of transportation to the Philippine markets or else make provision for loading export stock direct to ocean-going vessels at the mill. With such privately owned interisland transportation the lumber ought to be carried to Manila for from \$3.50 to \$4.50 United States currency per 1,000 board feet. There are no export duties on timber or manufactured products. Sawmill and logging machinery from the United States can enter duty free, and timber and logs are admitted to the United States without customs charges. Any mill with a capacity of 1,000,000 feet or more per month of export material is in a position to ship directly to the United States, China, and other countries, thus saving the cost of transportation to Manila and reshipment.

Labor Conditions

The Filipino has a natural aptitude for running machinery and is easily taught. Given a good, experienced foreman it is surprising how well a Filipino crew can handle a sawmill. They work for small wages—from \$0.25 to \$0.75 United States currency per day for unskilled labor—and if they are accorded fair treatment they make steady and permanent workmen. In the thinly settled forest regions it is necessary to bring in labor from

the more thickly settled provinces. To the lumberman the labor problem in the Philippines is not a difficult one. He will find that he has escaped many of the vexatious labor difficulties of the United States to meet comparatively few in the Philippine Islands. Patience and fair dealing will secure most excellent results.

Markets

Approximately 80 to 100 million board feet of lumber are used each year in the Philippine Islands. Of this, strange to say, a considerable amount is imported, although the amount of such imported lumber is steadily being lessened as the capacity of the Philippine mills increases. China, Japan, and Australia use yearly more than 200 million board feet of American lumber, a large part of which could be furnished by lumber companies in the Philippines if there were a sufficient number properly capitalized and equipped. A market for Philippine lumber has already been secured in the United States and to a lesser extent in Europe. As already stated, many Philippine timbers are unexcelled for interior finish, cabinet work, and other special uses for which imported woods are coming to be more and more demanded in the United States and Europe as the local supplies of hardwoods diminish.

In addition to lumber, the principal product of the forest, there are also found a great variety of so-called minor forest products many of which have a high and well recognized value in the markets of the world. Unfortunately the scope of a paper of this kind necessarily prevents more than a mention of the possibilities partially developed or latent in the forests of the Philippines. More detailed information as well as the names and addresses of the principal lumber dealers of the Philippines will be gladly furnished upon application to the Director of Forestry, Manila.

PHILIPPINE LUMBER EXPORTS

According to a circular just issued by the Bureau of Forestry the total revenue of the bureau on all forest products for the fiscal year 1914 amounted to P442,660 as compared with P390,664 for the year 1913. The export of lumber, timber and furniture increased while the imports decreased. The following official table contains a comparison of the imports and exports during the years 1913 and 1914.

EXPORTS

Fiscal year 1913		Fiscal year 1914	
Amount	Value	Amount	Value
Timber 531 c. m. . .	P19,326	Timber 1,768 c. m. . .	P61,744
Lumber 4,293,000 ft.		Lumber 7,760,000 ft.	
B.M.	429,628	B.M.	619,528
Furniture	24,790	Furniture	71,982
Total	P473,744	Total	P753,254

IMPORTS

Fiscal year 1913		Fiscal year 1914	
	Value		Value
Railroad ties	P47,546		P5,424
Timber	55,564		122,866
Lumber	1,093,746		965,476
Furniture	251,406		185,886
All others	266,632		263,926
Total	P1,714,894		P1,543,578

Comparing these two years, the timber and lumber exported show an increase of 88% in volume and of 59% in value, while the value of forest products imported shows a decrease of nearly 10 per cent.

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PUBLIC SPIRIT IN CHINA

President Yuan Shih-Kai on several occasions has issued Mandates somewhat similar in spirit to the famous exhortation to the British nation made by King George when Prince of Wales and which was condensed into the phrase "Wake up, England." In the latter case the nation was admonished not to permit slackness to allow commercial rivals to wrest the leadership from Great Britain. In China it is not a case of preventing the loss of laurels already won; the President's admonitions are intended to arouse the people to the grave reality of the peril that they may lose their national existence. He pointed this out when Japan forced China to sign the humiliating Sino-Japanese treaties in May last, and towards the end of July he repeated and re-emphasized his warning.

The President in this second warning directs attention to the neglect of discipline by the army, the irregularities in administrative affairs, the calamities of floods and drought throughout the provinces, the selfishness of some officials and the lack of public spirit among the people. In a picturesque phrase he says, "We are enjoying ourselves while reposing on a bed of straw with a kindling fire beneath it." He asks how many Chinese understand the real position of their country as compared with other nations. It was impossible to say that China was free from weakness, disorder and chaos and the Chinese should not be deluded into the belief that because China's territory and population were so vast they could not pass beneath alien rule. After the Sino-Japanese War and the Boxer Outbreak the people for the time realized the seriousness of their position, but they speedily forgot the lessons. During the recent Sino-Japanese negotiations the people showed that they realized that the country was in great peril, but this awakening would be useless unless it were permanent.

Having detailed the dangers and weaknesses, the President went on to urge that every individual Chinese should regard it as his sacred duty to avert the impending disaster of national extinction. It was not sufficient that the army could be relied upon to suppress banditti; it had to be made capable of meeting alien enemies if necessary. China should not be content with recovering the prosperity enjoyed under the late dynasty; the aim should be to develop the country by every possible means and to prepare for all emergencies.

That the President's warning is timely is beyond question, and there is a very grave danger of China losing her independence unless she demonstrates that she is genuinely intent upon reform. But there is no necessity for undue pessimism. A frank admission of shortcomings is the first step towards their correction. The President, very properly as he desired to arouse national spirit, laid great emphasis on the difficulties and dangers with which China is surrounded. It was no part of his duty, considering the object he had in view, to point out that an optimist might find good reasons for hope for China, but a commentator is justified in showing that the medal has two sides. Of course, unless China shows that she is sincere in her desire to reform, her ultimate fate is certain, but assuming, what we believe to be true, that she is really sincere and that all that is necessary is the organization of effort, there are one or two factors in the general situation that should inspire hope. The first is that there are at least two powerful and wealthy nations that desire above all things to see China preserve her independence. Of the good-will of Great Britain and of the United States of America China can have no doubt. These two countries wish to see the door of equal opportunity kept open in China and they would emphatically be greatly perturbed if any nation or a combination of nations sought to put a period to China's national existence. In fact, as long as China showed that she was endeavouring to reform they would not permit China's independence to be wrested from her. Self-interest as well as treaty obligations would compel them to unite to preserve China's independence. Those who doubt this contention may point to Korea. The original Anglo-Japanese treaty of alliance, it is true, recognised the independence of China and Korea, but it also recognised Japan's "special interests" in Korea. At no time had Korea been the subject of an agreement between several nations for the preservation of the open door.

In the second treaty of alliance signed in 1905 the reference to Korea's independence disappeared and Great Britain recognised the right of Japan to take measures of guidance, control and protection in Korea as she might deem proper. Thus, when Japan annexed Korea, the independence of Korea was *not* guaranteed by the Anglo-Japanese Alliance, but only by Japan, and few people ever harboured any illusion in regard to Japan's adherence to pledges. The independence of China is, however, guaranteed by the Anglo-Japanese Alliance and by the Root-Takahira agreement. The fact that Japan is associated with these two agreements would be a legitimate reason for fearing that China's independence was doomed, if their violation could be effected by Japan alone. But, while it is generally recognised that an undertaking given by Japan is not worth the paper it is written on, Great Britain and America would not permit her to violate her pledges. Japan received such a severe rebuff recently from these two countries when she began to nibble at these scraps of paper that she is not likely to endeavour to tear them up in the immediate future. China, therefore, has a powerful shield held before her by Great Britain and America, and she is thus secure from aggression for the time being. That is the most hopeful factor of the situation in which China finds herself.

Another circumstance that is distinctly hopeful, and to this the President refers, is the ebullition of national spirit when the drastic nature of Japan's outrageous demands became known. On other occasions Chinese patriotism has flamed out, notably when the Japanese Government insisted upon an "expiatory salute" being fired because the Japanese flag was hauled down on a vessel caught in the act of gun-running. But these demonstrations were local in character and cannot be compared with the wave of resentment that passed over the whole country when it was realized that in deliberate disregard of her pledged word Japan was trying to reduce China to the status of a subjugated nation. The intensity and wide-spread character of this agitation, and the readiness with which Chinese of all classes contributed to the National Salvation Fund suggested the existence of a very real patriotism far transcending the provincial sentiment of the past. Kwangtung felt the humiliation as keenly as Chihli, and for the first time in recent history the Chinese showed that they were as keen to resent an affront to the nation as a whole as to their own particular province. This indication of the disappearance of localism and the substitution of a broad patriotism is significant and encouraging. To a country without patriotism nothing is possible; to a country imbued with patriotism nothing is impossible.

It has been shown that China is not friendless and her people possess the love of country that must supply the base upon which to build a regenerated nation. All that is required to achieve success is continued and organized effort. The will to improve is not sufficient; there must be constant and well-directed effort towards improvement. The President's exhortation is addressed principally to the officials. The suggestion seems to be that while the people are thoroughly patriotic the officials are corrupt and devote their time to self-seeking. That this is true of some officials is well known. Though there are honourable exceptions it is undeniable that among many of the official servants there is less regard for the interests of the country than for the interests of themselves or their faction. The existence of the evil being acknowledged the obvious thing is to see what has caused it to exist and to remove the cause. A thorough reorganization of the service, civil and military, should be undertaken. There can be no doubt that the officials recognize that they have no security of tenure, that they owe their appointments less to merit than to influence, and that when that influence ceases to be operative their occupation will probably be gone. Appointment to the Government service should be secured by merit alone; appointments should be made only by a body so constituted as to preclude any suggestion of influence being employed, and any man appointed should know that as long as he performs his duties properly he will retain his position. If reform in this direction were brought about it is certain that the officials would be as patriotic as any other class. This is one of the fundamental reforms that when accomplished will make others easy to effect. With a strong, patriotic body of officials

stationed throughout the country, the work of directing the energies of the people as a whole into the channels of reform will be greatly facilitated. Leadership and initiative that cannot be expected from the official body as now constituted would be forthcoming, and the officials realizing that their first duty was to the country would strain every nerve to advance its interests and by so doing would inevitably better the condition of the people. The first and most important step towards reform would, therefore, seem to be the appointment of a full-powered and impartial Civil Service Commission.

THE CIVIL SERVICE IN CHINA

Point is given to the foregoing article entitled "Public Spirit in China" by a Presidential Mandate issued on August 5, some time after the article referred to was written. In this Mandate the President gives his views in regard to the conditions that prevail in the Civil Service in China. As the Mandate is of permanent interest we quote it textually.

"When discussing the methods of administration with Tsu Chang, Confucius remarked: 'The ideal administrator is one who steadfastly holds to his post and performs his work with constancy and faithfulness.' If an official harbours the idea that he is to serve in his post for only a brief period (literally, five days) and looks forward impatiently to a change or promotion, then he will naturally neglect his duties, because he does not put enthusiasm into his work. Therefore, during the ancient Dynasty of Tang Yu, only the merits of an official of three years' standing were considered. In the Han Dynasty, the Magistrates who served a long term and rendered good service were given higher ranks and greater salaries as rewards. Changes of officials were rarely made. As a result, the districts acquired good customs and the people had respect for authority. Such a result was by no means an accident.

"At the beginning of the Republican Era, the official system was thrown into confusion. The officials were so excited that they could not calmly sit down to transact business. When a Minister or a Governor was changed, whole staffs of the organs were often dismissed and new persons were employed. This is a bad practice which causes delay and confusion of official business. In foreign countries, the office staffs were not affected by the change of the senior official. Therefore the members of the official organs can work calmly without being anxious about their positions. This peace of mind is a great asset; it prevents confusion in the administrative affairs even when Ministers are changed.

"I have instructed the Civil Service Bureau to amend the Law Regarding the Examination and Appointment of Civil Officials. Besides the shifting of officials serving in their native provinces, all other officials shall serve a definite period of time before they can be transferred or changed. The length of terms of office shall be definitely fixed so that the officials can serve long in their posts. This is done to show the importance attached by the Government to official duties. A man can only do a little in a day, but he can accomplish much in a year. If an official is given opportunity and time, he will certainly make good and do his duties in a satisfactory manner. Thus the country will have efficient administration."

The most important portion of the Mandate is the third paragraph. Civil servants are to serve a definite period of time in the capacity in which they are employed before they can be transferred. Though this period of time is not defined it is to be "long," which presumably means for a period sufficiently long to enable the officials to become qualified for higher posts. This is certainly a step in the right direction as security of tenure would undoubtedly favourably react upon the work of the officials. But an amendment of the law relating to the examination and appointment of civil officials, if it only affects the one object of giving security of tenure, will leave a great deal of what is absolutely essential unaccomplished. The Civil Service Bureau should be a competent body, utterly without party affiliations, armed with powers to see that the officials in Government employment are competent to perform the duties with which they are entrusted. A great number of men have pitchforked into positions for which they have no qualifications because the "spoils to the victor" policy has hitherto prevailed. When the officials now employed have certificates of competency it will be time enough to give them security of tenure. Obviously

if men are confirmed in positions before their competency to fill them has been established the effect of the new system will be to shut out men who may be fully trained and qualified while retaining the services of those who have no qualification other than a "pull" in useful quarters.

Perhaps it would be difficult to introduce the competitive examination system, as it is known in the West, in China, but some local adaptation should be possible. The system itself was for long identified with China's national life, though it was employed in ways that frequently resulted in the round peg being fitted—or misfitted—in the square hole. A system of some kind is clearly needed and, even without preparing elaborate machinery, it would seem to be the obvious duty of the Government to ascertain whether officials' services were worth retaining before confirming them in their posts.

THE FALL OF THE OKUMA MINISTRY.

The Japanese Ministry headed by Count Okuma found it necessary to resign office early in August, and was reconstructed after the lapse of a week. Count Okuma remains at the head of the Government, but the one "strong" man of the late combination, Baron Kato, Minister for Foreign Affairs, has been relegated to private life. And thereby hangs a tale which is told elsewhere in this issue by "Britannicus." Many readers of that extremely timely article will be irresistibly reminded of the title of one of Captain Marryat's books, "Japhet in Search of his Father." The disclosures made by "Britannicus," who is a well-informed and competent observer, gifted with a particularly unprejudiced mind, might well be entitled "Japan in Search of her Policy." The article was written some considerable time before the Okuma Ministry drifted on the rocks of resignation, and it speaks well for his prescience that "Britannicus" hints at the likelihood of such a development.

If the theory that "Britannicus" advances be accepted, the Okuma Ministry went out of office, not only because of the alleged corruption of one of its members, but also because it was an organization of politically myopic leaders, without the capacity to lead and without clear knowledge of the goal towards which the nation might most advantageously be led. The political leaders of Japan, with one exception, are represented as men with a profound ignorance of statecraft and with but the haziest idea of Japan's international obligations.

In effect, "Britannicus" says that, contrary to general belief, Japan is less knavish than foolish. He says that in that country, which claims a political and intellectual equality with Western Powers, the opinions of most of the politicians are based upon blissful ignorance of outside considerations, such as the feelings of China and the interests of other Powers. Whether the indifference that Japan showed in the recent negotiations to any interests but her own was solely due to ignorance, must be a matter of opinion, but the new light thrown on the situation by "Britannicus" makes clear a great deal of what was formerly obscure, and explains the recent downfall of the Okuma Ministry. The Ministry we learn fell because Baron Kato, trading on the ignorance of his colleagues, committed the Ministry to an adventure in which partial material success was discounted by complete moral defeat. It would seem almost impossible to believe that after over two decades of "representative government," politicians who are accustomed to hearing periodical debates on foreign affairs should be utterly ignorant of the duties Japan assumed by her treaties with other Powers. But respectful consideration should be given to the view "Britannicus" takes, namely that Count Okuma and Baron Kato's other colleagues never realized until it was too late that his policy towards China was fraught with considerable danger. The fact that Baron Kato's name does not appear among those who form the reconstructed Ministry is in itself confirmatory. The acceptance of this theory necessitates, of course, an extremely low estimate being held of the intelligence of Baron Kato's colleagues, one of whom (Mr. Ozaki) spent many years in England and is well known to be in the habit of keeping himself in touch with

events abroad. It is a singular fact that the Peking correspondent of the New York "Sun," writing on May 21 last, made a semi-sarcastic suggestion that the Japanese Foreign Office was keeping the Premier ignorant of what was going on. Referring to the fact that Count Okuma had denied that Japan had ever asked for the appointment of advisers in China and that three weeks later the Japanese Government admitted that such a demand had been made four months previously, the correspondent said:—"The suggestion has been hazarded that the Japanese nation, departing from its traditional humility and lack of belief in its own inherent intellectual, moral, and material hegemony, has arrived at the opinion that the diplomatic and administrative methods of the West require improvement, and that a beginning has been made by keeping the Prime Minister entirely ignorant of the transactions of the Foreign office." That correspondent probably little thought when he made what was evidently intended to be a suggestion that carried inherent improbability on its face, that a well-qualified and competent observer should come to the conclusion that something of the sort should really have happened.

But if ignorance, which is not a valid plea for a defendant under British law, be held to excuse the Okuma Ministry for the arrogance shown towards China and the bad faith involved in misleading the Treaty Powers, what of Baron Kato himself? Here is the man who is considered the one strong and well-informed member of a Government deliberately seeking to commit Japan to what he knows to be violations of her treaty engagements. A man who had spent much of his life in diplomatic work abroad, and who must have had an intimate knowledge of the engagements that Japan had entered into with respect to China with Great Britain, with Germany, with Russia and with France, is shown by the disclosures to have formulated demands contrary both to the letter and spirit of those engagements. The spectacle presented is not a cheering one for any patriotic Japanese to contemplate—all the leaders of the nation crassly ignorant and incompetent except one, and that one possessed of mental attributes the exercise of which in social life leads to enforced seclusion.

The theory that Japan has no cut and dried policy in regard to China is probably correct. But there can be no excuse for ignorance on the part of men who are supposed to be qualified to act as rulers of the Japanese people, of the restrictions on whatever policy Japan may adopt imposed by the agreements that Japan has entered into of her own free-will. If Japan is to retain any sort of reputation for good faith she must confine her policy within the limits prescribed by her undertaking to maintain the independence of China and equal opportunity for all nations in China. Baron Kato formulated a policy that disregarded these limitations, and, though he has now been made the scapegoat, it is significant that the resentment of the country was not that Baron Kato had placed it in the position of a violator of pledges, but that its material interests had been jeopardized. "Britannicus" writes, "Japan is cross with the Government not because of the demands, but for getting the country into trouble," and we wrote in the June issue of the FAR EASTERN REVIEW: "Of course, it would be extremely unwise to assume that the indignation with the Government is due to an appreciation that Japan's actions in regard to China are morally indefensible. The failure to prevent the world from realizing that Japan was breaking her pledges entered into when she subscribed to the Anglo-Japanese Alliance was the real cause of complaint. The Japanese Government could break all the political commandments without fear of domestic criticism—if they were not found out." It is a source of satisfaction to find that this view of the agitation against the Government and particularly against Baron Kato, which some may have thought unduly cynical, is borne out by a writer who has evidently specially reliable sources of information.

But, granting that prior to the presentation of the twenty-one demands Japan had no formulated policy in reference to China, there is no reason to suppose that the formula prepared by Baron Kato did not accurately represent aspirations that had hitherto been inchoate and incoherent. In fact there is direct evidence that the formula was accepted by the Ministry

and the people of Japan, *after* they had become aware that the demands were incompatible with existing engagements. A study of dates proves this to be true. The full text of the demands was published in Europe and America in the middle of March. In the British and American newspapers articles at once appeared pointing out that the demands were incompatible with Japan's treaty engagements. The substance of these articles was telegraphed out to Japan and was published in the Japanese Press. However utterly the Government had failed to realize the significance of the demands when Baron Kato presented his formula for their approval, they must have attained full realization when the storm of disapproval from Great Britain and America broke over their heads. The elections were held in Japan on March 25 and the country overwhelmingly supported the Okuma Ministry in a policy the full significance of which neither the Government nor the people could, at that time, urge that they had failed to realize. Moreover it must not be forgotten that the agitation against Baron Kato in Japan was not solely due to disgust because he had estranged China's friendship and excited the suspicion of foreign Powers. Some of the severest criticism to which he was subjected was for his failure to compel China to accede to all the demands in Group Five.

It would be unwise and dangerous to assume, because Japan had not formulated her policy in regard to China into a platform of so many planks prior to Baron Kato coming to the rescue, that the demands presented on January 18 do not represent her aspirations. In fact we have just shown that after full realization of their significance the Okuma Ministry demanded, and the country enthusiastically gave, a mandate to carry through the programme. Baron Kato's colleagues and the Japanese nation with a full knowledge of the sentiment created in China and in other countries deliberately adopted his formula. It must, therefore, be accepted as a concrete policy, though we are of opinion that it is but a very faint expression of grandiose aspirations which will be formulated in the future if an opportunity should offer. Though Baron Kato has gone his policy remains and has been formally adopted by the Ministry and by the nation. What is that policy? Put in a nutshell it is the ultimate establishment of a protectorate over China, and in the meantime the extension of Japanese economic and political influence to the greatest extent possible. That policy conflicts with Japan's undertakings to preserve the *status quo*, and to maintain the independence of China and the principle of equal opportunity. But that would not deter Japan from adopting the policy that she thought most beneficial to her. Her action in regard to Korea showed that. Apart from the eventual annexation, in February, 1904, Japan entered in a treaty with Korea in which she guaranteed Korea's independence, but six months later she compelled Korea to agree to regulate her foreign policy in accordance with the advice of Japan, thus sweeping Korean independence out of existence. To argue that Japan will not attempt to pursue her policy in regard to China to its logical conclusion because it conflicts with her treaty engagements is to credit her with a respect for the sanctity of her word that experience does not justify.

The fact, therefore, has to be faced by China and the Treaty Powers that what might be called the preamble of Japan's policy towards China, has been definitely formulated and accepted by the Japanese nation. The countries whose interests are threatened should seize the first opportunity to take measures in unison to prevent the successful application of an individual formula to the destruction of the collective and international formula that has hitherto preserved the independence of China and given equal opportunity to all nations in the greater portion of the territory of the Republic.

INDUSTRIAL EXHIBITION IN PEKING

Although China has participated in many Exhibitions in other countries, in fact at the present time Chinese exhibits that have won numerous high awards are exciting much attention at the Panama Pacific Exposition at San Francisco, there has never been held in China itself a really comprehensive undertaking of

the kind. The educational value of a national exhibition, and the stimulating effect that it would have upon industry and commerce was held in view when the Ministry for Agriculture and Commerce secured the approval of the President for the establishment of a Commercial and Industrial Commission. One of the divisions of the Commission is entrusted with the collection and effective display of national exhibits. With the collection of exhibits at present in the museum attached to the Ministry of Agriculture and Commerce as a nucleus, steps are being taken to secure additional specimens and samples of representative products and manufactures. The importance of making the collection genuinely national in character has been impressed upon the authorities of the various provinces, and it is believed that there will be a gratifying response.

Great interest has been manifested in the undertaking in Peking and the surrounding districts and already a good collection of local products has been received. It is hoped that it will be possible to open the Exhibition at the end of September or early in October. The Exhibition will be of value to the Chinese in supplying opportunities of comparison of methods and results, and will be of equal value to foreigners interested in the export trade.

THE QUESTION OF AN EXHIBITION OF AMERICAN PRODUCTS

The American enthusiasts who dream of seeing a vast and imposing commercial museum rise somewhere in China to entrance the Chinese nation with a wide display of American manufactures are doomed to disappointment if the American Asiatic Association has the deciding voice in the matter. The *Journal* of that Association, in its July issue, throws a decidedly chilly douche upon the project—which, apparently, has been revived by the Chamber of Commerce of the United States—and recounts with emphasis the objections raised in 1903 when the subject was referred to the Association by the State Department. In the main we are constrained to admit that the contentions of the Association deserve the closest consideration of any one tempted to commit the State to the establishment of such a costly institution as a properly equipped and conducted commercial museum would undoubtedly prove to be. But those contentions should not be accepted as final by any group of manufacturers interested in the development of the China market.

While there are perhaps reasons why the State could not successfully set its hand to the inauguration and management of such a scheme, there is no apparent reason why non-competitive manufacturers should not combine on an adequate scale to exhibit their products and provide for their sale. One experiment of the kind failed some sixteen years ago, when the effort of the American Manufacturers' Association succumbed as a result of bad management, but that surely should not be advanced—as it is advanced by the *Journal*—as a reason why no further attempt should be made to give an impetus by exhibition to the introduction of American manufactures. Sixteen years ago, measured by the strides forward that have been taken in the enlightenment of China, was an aeon ago. In that period much smoke has gone up the factory chimneys, much experience has been gained by many men of conditions in China, and, what is more to the point, China herself has expanded tremendously in vision, has broadened extraordinarily in knowledge of occidental methods, and has developed remarkably as a machinery using country. Sixteen years ago the Chinese people still fought against the introduction of railways; to-day they agitate for them. In sixteen years all conditions have materially and significantly changed, and that important fact should not be forgotten when mournful lachrymation is prompted by thoughtless reflection upon the unhappy failure of—sixteen years ago.

"With the remembrance of this fiasco still fresh in the minds of those most interested in the promotion of trade with China," says the *Journal of the American Asiatic Association*, "it seems hardly probable that the Chamber of Commerce of the United States will be able to elicit any hearty response to the appeal which it seems about to make on this subject."

Why? On the contrary the very remembrance of the distant date of that "fiasco," and the very fact that China is known as a market of tremendous potentialities, affording ample room for the enterprise of manufacturers of all nations, should, instead of deterring, compel progressive men to reconsider the situation in the light of modern conditions and inspire them to respond to any invitation the Chamber of Commerce may tender for discussion of proposals for the general public good. The *Journal* then goes on to say:

"Apart altogether from the possibility of securing the right kind of man to take charge of an American commercial museum in Shanghai, there is the question of whether under any possible superintendence such an institution could be made useful for the promotion of trade. When the subject was referred by the State Department to this Association in 1903, the following were indicated as fatal objections to the sample warehouse plan which had been revived in a bill introduced by Senator McCumber of North Dakota: To be of any serious value, the establishment must be equipped not only for the exhibition of samples but for the taking of orders for the merchandise which the samples represent. In short, the sample warehouse must enter into competition with the business of American citizens and the manager would himself have to become a merchant and importer. If it be assumed that the true sample warehouse, in a great commercial port like Shanghai, is not the place of business of the American importer and that a commercial museum could be placed in hands more energetic, resourceful and capable than those of the men in charge of the interests of established American houses, the question will recur: By what possible ingenuity could a warehouse in Shanghai equipped solely for the exhibition of samples of American manufactures be kept in daily touch with the constantly changing prices of the vast range of products which it would be expected to display? The cable tolls of a single mercantile house in Shanghai called for by the necessity of keeping pace with the movement in prices of commodities reach a sum in excess of the whole annual appropriation proposed for the maintenance of a sample warehouse. Twelve years have not robbed these objections of any of their cogency, and the Chamber of Commerce of the United States would do well to give them careful consideration before proceeding further with what its officers evidently regard as a highly promising scheme."

With these arguments, when they are applied to a State project, we are inclined heartily to agree, but we decline to admit that they will hold even so much as a drop of water when applied to an institution organized by a strong combination of manufacturers whose representatives would be on the ground to demonstrate the value of their wares and conclude contracts for their sales.

Apropos this subject it is interesting to recall one or two recent propositions of the kind that seem to have faded into thin air. On December 23, 1913, the Hon Mr. Pomerene, in the Senate of the United States, introduced a joint Resolution, (Calendar No. 144 S. J. Res. No. 94, Report No. 179) that the

"Secretary of Commerce is hereby authorised to investigate by a Commission of not more than three qualified persons, the conditions of trade with China for the purpose of determining upon ways and means for its expansion, and to particularly determine whether or not it would be desirable for the United States of America to establish and maintain there at some convenient centre, a permanent exposition of the products of the fields and industries of the United States on terms which might make the exposition self sustaining when established.

"That for the purpose of the aforesaid there is hereby appropriated and made available in the hands of said Secretary, from money otherwise unappropriated in the Treasury of the United States of America the sum of \$20,000."

This was approved by the Senate Committee on Commerce, and was placed before the House Committee on Foreign Affairs under the designation of "House Joint Resolution No. 183."

Inspired by this evidence of the American Government's readiness to investigate conditions in China a Chinese, named Wong Ching—described as "Counsellor, Chinese National Party," of the Kwong Chee Library, Chicago, Illinois—backed by certain American citizens, submitted a scheme to the Chicago Office of the Department of Commerce, for the establishment of a United States Building at Shanghai to be called "The China Burlingame-Ward Memorial." The scheme was a decidedly ambitious one. The building was to commemorate the names of the Hon. Anson Burlingame, former U.S. Minister to China, and member of China's first Embassy to foreign countries



PROPOSED BURLINGAME-WARD MEMORIAL BUILDING
Planned to House United States Government Offices and Provide for
Commercial Exhibit of Shanghai

in 1867, and General Frederick Townsend Ward, of Taiping Rebellion fame, two citizens of the United States, the originators of the project declared, "whose individual work, fundamental in its quality and abiding in the result, made the Republic of China a possibility." The proposed building was to cost \$750,000 (U.S. currency), was to be erected upon a self-sustaining basis, and was designed to house the various Departments of the United States Government and to include space for a permanent exposition of the products of the fields and industries of the United States. (See illustration at top of page). It was to contain arcades and stores, lecture halls, bank quarters, safe deposit vaults, restaurants, library, Red Cross and Missionary quarters, club rooms, etc., as well. The space for exhibition purposes was to approximate 11,250 square feet and was to occupy the fifth, sixth, seventh and eighth stories of the building. From rent it was estimated that \$85,000 (U.S. Currency) per year could be obtained, while the maintenance costs were estimated and estimated at \$33,820 (U.S. Currency) for the building and \$44,150 (U.S. Currency) for the Commercial scheme. The staff for this latter purpose was detailed as follows:

Commercial Director	-	-	-	-	\$10,000
Assistant	-	-	-	-	5,000
Secretary	-	-	-	-	2,500
Disbursing Clerk	-	-	-	-	1,200
Director Building	-	-	-	-	1,200
Librarian	-	-	-	-	1,000
2 Assistants	-	-	-	-	1,000
2 Commercial Lecturers	-	-	-	-	1,000
4 Attendants	-	-	-	-	1,000
Chief Clerk, American	-	-	-	-	1,500
Chief Clerk, Chinese	-	-	-	-	750
Catalog Clerk	-	-	-	-	1,000
Trade Paper Account	-	-	-	-	1,000
Newspaper Account	-	-	-	-	2,500
Railroad Account	-	-	-	-	1,000
Steamship Account	-	-	-	-	1,000
2 Commercial Teachers	-	-	-	-	2,000
Information Clerk	-	-	-	-	500
Tariff Clerk	-	-	-	-	1,500
Interpreters, all languages	-	-	-	-	2,000
2 Chinese Interpreters	-	-	-	-	1,000
Postage	-	-	-	-	1,000
Stationery	-	-	-	-	1,000
Miscellaneous Account	-	-	-	-	2,500
					\$44,150

This is the first scheme of the kind that we know of which has been gone into in detail, and though nothing materialised when the projectors were active it is quite likely that it will again come into prominence now that the Chamber of Commerce shows a disposition again to consider the question of exhibiting American wares in this part of the world.

Another project advanced by Americans was for a model city. Mr. W. J. Corry and ex-Governor Adams, of Alaska, in company with a wealthy Chinese merchant from New York, visited China, saw President Yuan Shih-kai, and endeavored to persuade the Government to grant a tract of land upon which to found a city on model lines in respect to every department of construction and administration. The central feature of the project was, of course, a permanent exhibition

of American products. The city was to be self-supporting, and to launch it a company was to be formed to provide the necessary capital. The idea was so utopian that even the Chinese, who have a weakness for and delight in dreams, failed to take any more than a passing interest in it, and from what we can see it has, like many another scheme of enthusiasts, been laid away in the limbo of forgotten things.

All these projects show, however, that there is a desire on the part of many Americans to see their country and its products more permanently and effectively established in this field. But so far no one seems to have hit upon a plan of procedure that will appeal to the manufacturer as eminently practicable. It is certain that the business men of America, who are famous for their hard-headedness, will not discard any proposal pregnant with success. On the other hand they are certain to jump at it, and in the absence of evidence of a definite movement to establish an exhibition in China we can only conclude that no feasible plan has yet been evolved, or, if one has been that no man carrying sufficient weight, has yet come forward to present it.

THE ANGLO-CHINESE ENGINEERS' ASSOCIATION, LTD.

A refreshing illustration of the fact that the Briton is capable of doing two or three things at the one time is furnished by the formation in England of a new Association of Manufacturers to seek openings in China for the products of their factories. Despite the abnormal disturbances caused by the great war, in which the British Empire is one of the most valiant participants, English industrial managements are able to think ahead and prepare for the day when peace shall prevail and workshops shall be making machinery instead of munitions. Not the lust of battle nor the wild helter-skelter rush of their mills to keep pace with the tremendous needs of the British armies apparently have the effect of clouding their viewpoint. Through the murk of battle they are able to see the possibilities of expansion in China, and to take advantage of those possibilities a number of them engaged in non-competitive production have grouped themselves and have organized a selling medium under the title of the Anglo-Chinese Engineers' Association, Ltd. This war-born organization will eventually fly the British flag in China and endeavour to gain conquests for British-made machinery. The field is a large one; there is room for them; and all admirers of sensible organized effort will applaud the appearance of a well-armed engineering Richmond entering the fray of the peaceful constructive arts, particularly as he emerges from the clamours of a destructive and bloody European strife.

The new Association has been organized by Mr. Arthur J. Moore Bennett, whose energetic and trenchant pen has long been employed in an effort to awaken the British people to the potentialities of the markets of China. In him the Association has an energetic manager, possessed of an intimate knowledge of a large part of China, as well as acute powers of observation, and a keen nose for markets. Hitherto he has striven to influence others to be up and doing, and his appearance in the ranks now looks as if, in desperation, he has decided to gird his loins and conduct a campaign himself. As the Lord helps those who help themselves we have no doubt that the new Association, when it is installed, will find the venture it is making highly profitable. China is bound to go on expanding, and those on the ground deserve all that their foresight and prudence enable them to garner as developments proceed. The London address of the new Association is 88 Fenchurch Street, E.C.

COTTON IN CHINA.

It has always been a matter for surprise that cotton cultivation and manufacture has not shown more progress in China. In many parts of the country the soil is eminently suitable for the cultivation of the cotton plant. The staple

is very short, but this defect can be, and to some extent has been, remedied by the introduction of better seed. With her inexhaustible supply of cheap, but efficient, labour China should be able to grow and manufacture enough cotton to supply most if not all her requirements. This is far from being the case. In 1914 China imported cotton goods to the value of \$267,388,500 Mexican currency.

The Commercial and Industrial Commission which was recently established by the Ministry of Agriculture and Commerce has issued a circular letter to the provincial authorities in Chihli pointing out the situation in regard to cotton and emphasizing the necessity of preventing so much money annually being sent out of the country. It was urgently necessary that means should be adopted to encourage cultivation and the establishment of mills. In order that an organized and systematic effort might be made to cause increased cultivation and manufacture, the Commission is obtaining specimens of the seeds used in the districts where cotton is cultivated and samples of cotton cloth manufactured in Chihli. A careful examination will be made of these and suggestions that will make for improvement given where required. It is hoped that, if in Chihli sufficient cotton can be grown and manufactured to meet local wants, the object lesson thus supplied will inspire the other provinces to adopt measures directed to a similar end.

NEED OF AN INSPECTORATE-GENERAL OF RAILWAYS

On August 12 President Yuan Shih-kai issued a Mandate in connexion with the administration, or mal-administration, of the Peking-Kalgan Railway which again emphasises the pressing necessity for thorough reform of railway management in China. The railway system of the Republic is expanding to such an extent that serious attention must be given at an early date to the introduction of measures calculated not only to remove the conditions which provoked the Presidential wrath, but for all time to allay any anxiety that might be generated in the minds of foreign bond-holders by reports of faulty control or the misconduct of responsible railway officials. The only measures so far adopted to cope with the mishandling of finances, and at the same time to inaugurate some definite book-keeping system, are those embraced in the scheme for the unification of accounts. Splendid as this advance is it is not sufficient. What is needed is the creation of an Inspectorate-General of Railways, the duties of which will be the general management of all of the State lines now in operation or in course of construction. China has no adequate central instrument for the efficient development and administration of what should be her greatest earning factors, and the time is rapidly approaching when she will be compelled by outside influences to create such an organization as that suggested if she does not of her own volition do so. A wise government would set to work at once to engage from abroad experts in railway control; men who have proved their competence; who would come to China as servants of the Chinese Government; who would work under the Minister of Communications for the economic development of the railways, and who would be proud to reorganize and elevate the system to the plane which it should occupy. The lines are now notorious for their lack of homogeneity in management, though it must be said efforts have been made by foreign officials, with some little success, to co-ordinate essentials. However, the question still remains one of the most important confronting China, and there seems to be no other method of dealing with it than to appoint a specially equipped Inspectorate-General with adequate powers of administration.

CHINA'S RAILWAY ACCOUNTS

Dr. Adams, the American expert engaged by China to organize a unified system of accounting for railway purposes, has returned to Peking to continue the excellent work which he and the Commission appointed for the purpose inaugurated

last year. The conferences held when Dr. Adams was last in China resulted in the adoption of rules for the classification of capital expenditures; for the treatment of new lines and extensions and of additions and betterments; for the classification of operating revenues; for the classification of operating expenses of railways; for the income, profit and loss and the surplus appropriation accounts, and for the classification of the general balance sheet accounts of railways. The work now to be undertaken will be the unification of station store accounts, which is designed to prevent what is commonly known in China as "squeezing," and the preparation of a system for annual scientific statistics. With the completion of the work now contemplated China should have the most thorough railway accounting system in the world. All that is needed to make it effective is consistent enforcement of the system by the Government, and it is to be hoped that the wisdom of persistency in that regard will be realised by the Government.

THE OIL RESOURCES OF CHINA

Hopes were entertained that the negotiations which were carried on in Peking for some months between the Chinese Government and the Standard Oil Company would reach finality early in August. This expectation, unfortunately, has not been fulfilled, and there seems to be little likelihood of any agreement being reached in the immediate future.

The negotiations were based upon an agreement* signed on February 10, 1914, between the Republic of China and the Standard Oil Company for the exploitation of oil fields in Shensi and Chihli. In accordance with this agreement the Company was to send experts to make a thorough investigation of the Yenchang, Yenafu and adjoining fields in Shensi and the Chengtehfu and adjoining fields in Chihli, the cost to be borne by the Company and the Government jointly. If these investigations showed that the fields could be worked with advantage, an American-Chinese Corporation was to be formed. The capitalization was to be 55 per cent. Standard Oil Company and 37½ per cent. Chinese Government, the 37½ being payment by the American-Chinese Corporation for the franchise. The Chinese Government was also to have the option of purchasing the remaining 7½ per cent. of the capital stock at par within two years of the formation of the Corporation. The Government agreed that the working of petroleum in the fields named should be exclusively entrusted to the American-Chinese Corporation to develop, refine and market for sixty years. If the fields examined proved to be worthless, other districts might be exploited. A clause provided that a royalty not exceeding 1.5 per cent of the value of crude petroleum at the place of production should be paid to the Government. For one year after the signing of the agreement no concession of petroleum-bearing properties in any part of China was to be given to foreigners.

A party of experts and the necessary machinery were sent from America, and after delays from various causes a thorough examination was made of the oil-bearing districts in Chihli and Shensi.

The agreement between the Chinese Government and the Standard Oil Company expired on February 10, 1915, but, as arrangements for the formation of the American-Chinese Corporation had not been made at that date, the Chinese Government has from time to time extended the agreement. Latterly the negotiations have been conducted on behalf of the Standard Oil Company by Mr. W. E. Bemis, one of the Vice-Presidents of the Company. Agreement was found to be difficult with regard to several points in a new proposal made by the Standard Oil Company. Proposals for refining and marketing were unacceptable to the Chinese Government as they deemed them to be a departure from the original agreement, and to be in the nature of a monopoly, and accordingly counter-proposals were made. These, in their turn, did not prove

acceptable to the Standard Oil Company and, for a time at all events, a deadlock has been reached.

It will be sincerely hoped that some satisfactory solution of the difficulty will be found possible. At the present time it is all important that no opportunity should be lost of developing China's resources, and the fact that the Standard Oil Company was willing to enter upon the negotiations may be accepted as a proof that the investigations that have been made showed that the Shensi fields at least are worth exploitation. In the interests of all concerned it is to be hoped that it may be found possible to proceed with the development of these fields, as the benefit accruing would be shared by the whole country and not solely by the districts immediately concerned.

LAND TAXATION IN CHINA

Some little time ago we briefly described the measures that were being taken to reform the system of land taxation in China. While the necessary investigations will take a considerable time and general reform will be a matter for the future, some steps have already been taken that will have the effect of increasing the revenue from this source. Immediately after the Revolution the land tax machinery was working very badly. The provincial authorities in many instances collected the revenue on their own account, and in some cases the tax was decreased or abolished. As soon as the Central Government were in a position to do so they restored all the customary levies and charges and instructions were issued that the land tax should be collected in silver coins instead of taels or cash. The practice that had formerly prevailed of permitting the provincial authorities to deduct from the amount raised the cost of collection was abandoned. In many instances the cost of collection was out of all proportion to the total amount raised, consequently the provincial authorities were directed to meet this cost out of other provincial revenue.

As a result of these measures the Ministry of Finance in 1914 received an appreciable sum from land taxation. Some provinces remitted over \$1,500,000 more than had been received the previous year, and the saving in the cost of collection, which was added to the national revenue, was about \$2,000,000. When the survey that is now being undertaken is completed it is expected that the revenue will be greatly increased. Until a proper survey has been made it will be impossible for the Government to put into force uniform regulations, and consequently collections will continue to be made at the varying rates that at present prevail. An equitable system of grading lands and the adoption of uniform rates of taxation are expected to result in doubling the revenue from this source. Moreover the survey will result in revenue being derived from much land that now escapes taxation. Previous surveys were very carelessly made, and the landowners were frequently able by corrupting the officials entirely to escape taxation. Even when the land had been surveyed with approximate correctness the owner was often able to evade the tax. So much corruption prevailed that wealthy landowners were able to induce the tax-collectors to leave them unmolested and to endeavour to make up the deficiency in the revenue by extorting a double tax from those who were too poor to obtain exemption by bribery. While it is impossible to ascertain with any degree of exactitude the extent to which this practice was carried on, it is certain that it was widely prevalent in the past and that there was much consequent loss of revenue.

With proper organization and honest administration it should be possible to obtain from the land tax a revenue equal to the total revenue from all sources now obtained by the Central Government. The estimated revenue from the land tax in 1913 was about 82 million dollars, about a quarter of the total estimated revenue. The land under cultivation in China was estimated in 1905 to amount to 650,000 square miles or about 400,000,000 acres. Taking the revenue at \$82,000,000 the tax is twenty cents Mexican currency per acre. Of course the productive capacity of the land varies greatly in different parts of the country and its value is affected by facilities for

* This agreement was published in full in the February, 1914, issue of the FAR EASTERN REVIEW.

transportation of produce and so forth. These differences would preclude the imposition of a uniform tax, but the assumption that the landowners could bear a tax that would average \$1 per acre seems to be justified. Direct taxes are always unpopular, but as China is debarred from increasing her Customs duties she has no alternative. A tax that averaged \$1 per acre would probably not be found oppressive if the original valuation of land were fairly made and nothing beyond the assessed tax extorted by the collectors. However, to render the tax acceptable to those who pay it, the Government will have to exhibit a willingness to recognise its obligations to a greater extent than in the past. Taxes are levied to provide the Government with the funds necessary to give security to life and property, and to carry on the administration of the country for the benefit of the people. The landowners would pay their share more contentedly if they knew that their lives and property were thereby given proper protection and if roads, railways and canals were constructed or extended to afford them greater facilities for marketing their produce. The Republican Government have succeeded in restoring order throughout the country and may be said to be thus fulfilling the primary duty of every Government. Reasonable security for life and property has been afforded. As the revenue grows so should the efforts of the Government to improve the transportation facilities increase. Expenditure of part of its revenue in this way will be not only beneficial to the landowners but will increase the capital value of the land and, as periodical revaluations will undoubtedly be made, the future revenue will also increase. There is reason to suppose that the Government are fully seized of these facts, and that increased revenue from land taxation so far from causing an additional burden to be laid on the people will result in an appreciable improvement of their condition.

THE TSINGTAU CUSTOMS

The negotiations in regard to the control of the Chinese Maritime Customs Office at Tsingtau have terminated in a manner more satisfactory than was expected. It will be remembered that when Kiaochow was surrendered the Japanese Military Authorities took over the civil administration at Tsingtau and also the Maritime Customs Office. The original agreement for the establishment of a Maritime Customs Office at Tsingtau was signed at Peking in 1899 by Sir Robert Hart, then Inspector-General of Customs, and the German Minister. This agreement provided that the Customs Commissioner at Tsingtau and the members of the European staff of the Customs Office should be of German nationality. An amendment of this agreement was signed in 1905 by which the Chinese Government agreed to hand over to the German officials at Tsingtau 20 per cent of the net import duties collected as its contribution to the expenses of the territory.

Relying upon the repeated assurances of the Japanese Government that the territory of Kiaochow was to be handed back to China, as soon as things settled down in the port, China notified Japan that she proposed to appoint a Customs Commissioner at Tsingtau, the gentleman selected being the British Commissioner at Mukden. To this Japan at once entered an objection. China then nominated the Japanese Commissioner at Soochow for the post, with a British Deputy Commissioner, but Japan again objected. With a sincere desire to meet Japan's wishes China was prepared to eliminate the British Deputy Commissioner, but this proposal was rejected. Finally China nominated Mr. Tachibana, the Commissioner at Dairen, to the post at Tsingtau. This was regarded as unsatisfactory by Japan and the counter-proposal was made that Japan should appoint the Commissioner and staff from the Japanese Customs Service. It was, of course, impossible for China to agree to this remarkable proposal as it would have involved permitting a foreign Power unwarrantably to interfere with her domestic administration, and would have meant the injection into China's Customs Service of foreign officials who in many cases would have taken precedence over men who had served China long and faithfully. To overcome the difficulty China suggested that Mr. Tachibana should be appointed Commissioner and that eight

members of the Imperial Japanese Customs Department should be permitted to join the Chinese Customs Service in the lowest grade. This further concession was rejected by Japan.

The negotiations dragged on throughout December, 1914, but in January the notorious twenty-one demands swept smaller questions into oblivion. The Tsingtau Customs matter was not taken up again until July, but in the interval Japan appears to have recognised the wisdom of moderation. On August 5 an agreement was signed by Mr. Aglen, Inspector-General of Customs, and Mr. Hioki, Japanese Minister in Peking, which provides:—First, that the Chinese Maritime Customs shall resume its functions at Tsingtau; secondly, that business shall be conducted, pending a settlement of Tsingtau affairs after the war, in accordance with the arrangements made with Germany, except that Japanese officials shall be employed instead of Germans; thirdly, that the Japanese military government shall hand over the Customs property, archives, and funds, etc., acquired at the time of the occupation of Tsingtau, and fourthly, that the Japanese military government shall hand over the revenue collected since the occupation, less the proportion due to the local government in accordance with the arrangement made with Germany.

There is also an arrangement for increased Japanese representation in Customs Service.

This settlement of a question in which highly important considerations were involved will be welcome. If Japan had persisted in her original demands she would have found it difficult to defend her action. The Chinese Maritime Customs Service, though largely officered by foreigners, is a portion of China's domestic administrative machinery. The nomination of officials to posts is a prerogative of the Inspector-General, who is responsible to the Chinese Government, and it would obviously lead to the utter disorganization and demoralization of the service if foreign Powers were permitted to control his actions. The service of much of China's indebtedness is provided by the Customs revenue, and the Powers interested would be greatly perturbed if control of the Customs service were to be regarded as a prize of war. It is understood that Japan is dissatisfied with the amount of representation given to her in the Maritime Customs Service, and that she considers that as she is second in the China trade she should supply a larger proportion of officials. The argument is specious enough, but Japan should not forget that any proportion of officials to trade must be very rough and ready and should certainly not be based upon results of martial operations. If Japan were engaged in a war with a great naval Power and the Japanese flag was swept from the seas, would she contend that as her trade with China had ceased all Japanese officials in the Chinese Customs should be dismissed? It would be most highly regrettable if the Chinese Maritime Customs Service were to become a plaything in international politics, and Mr. Aglen is to be congratulated upon preventing the recognition of a principle the adoption of which would certainly lead to disaster.

RAILWAY CONSTRUCTION AND THE WAR

One of the results of the European war is the practically complete stoppage of all railway construction in China. Dependent as they are upon foreign loans for this important work the Chinese Government are unable to proceed with the internal development of the country unless the foreign financial markets are open to them, and the result of the upheaval in Europe is that China must stand still so far as railway expansion is concerned until long after peace is established. America can and may step into the field, but for some reason difficult to explain the capitalists of that country have never evinced any particularly keen desire to participate in the great developments proceeding in China. There are opportunities for them now, and judicious procedure might easily land for them a line or two which Continental powers now heavily involved in war might be only too glad to hand over.

At present the work on the Pukow-Sinyang railway, being financed by the British, is being closed down. The whole of

this route—some 250 miles—has been surveyed, the plans have been completed, and nine miles of earthwork have been constructed. Unhappily the loan for the construction of the line was not floated before the war began, and the work so far done has been carried out upon advances made by the British and Chinese Corporation.

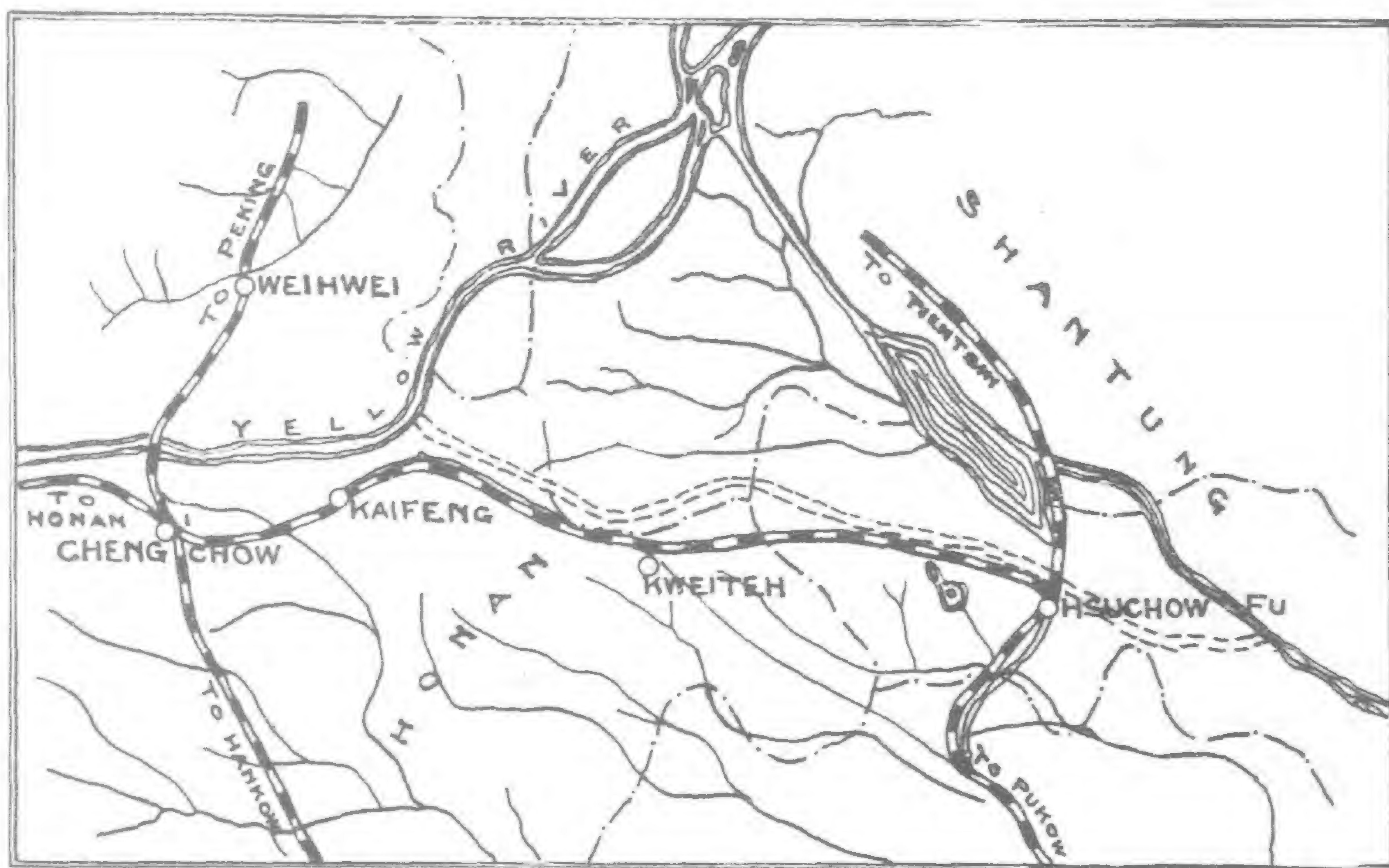
The survey of the projected railway between Nanking and Pinghsiang is being continued but when completed about June next, operations will cease unless conditions have materially changed and money is available.

On the railway under construction between Lanchow and the sea, work is being carried on in a desultory manner upon finances derived by a local Chinese loan. The section connecting Kiafeng and Hsuehowfu, on the Tientsin-Pukow Railway, has been practically completed and traffic is now being carried upon it, and the Managing-Director of the line is making brave efforts to have work to the west of Honan continued despite the war.

wagons being of the type used on the Peking-Hankow railway. Workshops are situated at Chinchow and Hsuehowfu. Construction was begun in the spring of 1914 and was finished in June of 1915.

The Pukow-Sinyang Railway

As mentioned above, work on the Pukow-Sinyang Railway has been temporarily suspended, though an effort was made to finance continued construction by floating a loan in China. Negotiations between the British and Chinese Corporation, Ltd., the concessionaires for the railway, and the Government resulted in no agreement being arrived at on the subject and it was dropped. It was suggested by the financiers that a silver loan of some \$12,000,000 should be raised in China, the original sterling advances made by the financiers to carry out the survey, etc., totalling some £200,000, also to be converted into silver; the whole to be redeemed at a later period by a Gold loan to be floated to complete the construction and equipment of the railway.



THE NEWLY CONSTRUCTED RAILWAY FROM KAIFENG TO HSUEHOWFU

On the Shasi-Shingyifu line, a portion of which has been surveyed, work has been definitely suspended until after the war; and on the lines from Tatung to Chengtu, and from Yanchow to Yunnan and Chungking, nothing has yet been attempted, and cannot now be attempted until the financial sky materially clears.

Operations are still continuing on the extension of the railway from Kalgan to the Yellow River, via Tatung. The money now being used was derived from a local loan, but it will be insufficient to carry construction work far, and a stoppage will have to be made unless further funds can be raised.

The Kaifeng-Hsuehowfu Line

As mentioned above the connexion has been made between Kaifeng and Hsuehowfu, thus creating a link between the Peking-Hankow and the Tientsin-Pukow railways. The route follows the embankment of the old bed of the Yellow River over a total distance of about 200 miles, and is free from any engineering difficulties whatever. In fact it is almost perfectly level. The total waterway on the line is 4055 metres, comprising 89 steel bridges, of a total of 3315 metres, and 5260 culverts measuring a total of 740 metres. The gauge is the standard; the rails are 85lb Hanyang steel; and the sleepers are partly Belgian steel and Japanese timber. There are ten stations on the line, and ten flag-stations. The locomotives, of which there are six, are of French and Belgian pattern, the cars and

China objected to a suggestion that the silver loan should be redeemed as soon as a gold loan should be raised in the future, though she expressed readiness, we understand, to redeem the silver loan in a specific number of years. China appears to have balked at the double discount that would come to the Banks as a result of the manoeuvre, it having been proposed that the silver loan should be issued at a discount and be redeemed at par upon the issue of the gold loan. As an alternative China suggested that a silver loan should be issued as part of the sum called for in gold in the original agreement, the term of the silver loan to be forty years, and the security to be similar to that called for in the original agreement with interest at 6 per cent., while the discount suggested by the financiers was accepted by China. The parties could come to no agreement on the question, and it was ultimately decided to suspend operations.

CHINESE EASTERN RAILWAY CAR SHORTAGE

The dearth of goods cars along the Chinese Eastern Railways continues, most of them being requisitioned by the Government to convey supplies from Vladivostok to Western Russian bases. These return with wheat, etc., which is being shipped to France. Many local importers, who have been waiting in vain for goods due at Vladivostok from Harbin, are now having them re-shipped by steamer to Dairen and from the Japanese port by sail to Harbin.

GOVERNMENT IN CHINA

Nascent Agitation for a Revival of Monarchy in China

The question of the form of government most likely to give the best results in China, has again become a subject of public discussion. Particular attention has been directed to the question by the establishment of a "Society of Peace" in Peking, which has openly pronounced in favour of a reversion to the monarchical form of government.

In considering a problem of this nature care has to be taken not to confound theory and actuality. From a purely academic standpoint it would be difficult to controvert the assertion that the republican system of government is superior to the monarchical. Theoretically, under the former system every citizen is given an effective voice in the management of national affairs. As the government is created by the citizens it is in theory an inferior body employed to carry out delegated duties. The same power that created it could at any time destroy it. In an ideal republic the citizen would be supreme. In practice it is doubtful whether the average citizen in a republic enjoys a larger voice in national affairs than the average subject of a constitutional monarch. In many instances the citizen has less opportunity of making his voice heard than the subject.

Under any form of government the actual power is wielded by a few individuals. To the practical man it makes very little difference whether these men are appointed by a monarch holding his position by hereditary right or by a president who owes his elevation to the fact that a plurality of the citizens consider him the man best qualified for the position. In each case, assuming government to be conducted on constitutional lines, the monarch and the president exercise but little personal power. They are both part of the respective governments, but in neither case are they *the* government. The government, whatever the appellation of its titular head, is composed of units that have no hereditary rights to their positions. This is true even of countries where there is a second chamber of hereditary nobles. Consequently, as a matter of fact the subject of a constitutional monarch has as much voice in national matters as the citizen of a republic, as he helps to choose those who exercise the government functions.

It is impossible in a consideration of this kind to form general conclusions from a study of particular cases. The United States of America have attained power and wealth under a republican form of Government. The British Empire has attained power and wealth under the system of constitutional monarchy. It is possible that the United States would have made as much progress under a monarchy, and that the British Empire would have become no less powerful and wealthy under a republican system. These two countries are taken as examples because they employ the same language and are the two nations that have for the longest time continuously adhered to the form of government that still prevails. The government of the United States of America has been republican since it was established; that of Great Britain has been a limited monarchy since the time of King John, with a brief interregnum of fourteen or fifteen years. France has alternated between autocracy and republicanism. As we have said, it is impossible to declare from the study of the progress of particular nations that republicanism is demonstrably a better form of government than monarchy.

Clarity of definition is all-important in an inquiry of this kind. What is meant by "the best form of government"? We take it that the best form of government is that under which the life, the liberty and the property of the individual are the best protected. Evidently it is necessary to know in what consists the fundamental duty of government, before it becomes possible to argue that one form is better than another. Granting that the protection of life and property and preservation of liberty are the primary objects for which governments exist, what does history teach of the respective ability of republicanism and monarchy to secure these ends. The candid must admit that, other things being equal, the duties can be performed as well

under the one as the other. Possession of life, liberty and property is as assured in the United States of America as in the British Empire. The citizen of the one is as safe and as free (but not more safe or more free,) as the subject of the other.

The comparison made is between two states which have used moderation in the practical application of their political ideals. In countries in which more extreme views have determined the form of government the evidence points to life and property and even liberty being better safeguarded under a monarchical than a republican government. In Russia for example there is much greater security than in Mexico. Theoretically the Mexicans enjoy greater liberty than the Russians, actually they have much less. There is no protection given them by their courts; their property is liable to be commandeered; their liberties and even their lives are held on a precarious tenure. Every Mexican has a theoretical opportunity of becoming chief magistrate of his country, and the result has been that every aspiring individual who could gather a following sought to seize the position by force. In Russia the post of chief magistrate is by law vested in one family and for centuries there has been no attempt to change the dynastic succession. What is happening to-day in Mexico has happened in the past in Guatemala, Venezuela, Peru, the Argentine Republic and other Spanish-American states. It might then be argued that there is at all events a better prospect of domestic tranquillity in countries in which a monarchical system of government obtains. Dynastic struggles have become practically unknown.

The nascent agitation for a revival of monarchy in China is attributed to some statements said to have been made by Professor Frank J. Goodnow, Constitutional Adviser to the President. Dr. Goodnow was said to have stated that "a monarchical system of government is better than a republican system." The Society of Peace, to which reference has already been made, taking this alleged statement as its text, issued a manifesto on August 16. In this it was declared that the republican form of government was adopted in China without its suitability for the people being carefully weighed.

The civil disturbances in Mexico and other Spanish-American states and in Portugal since the revolution were referred to, and the people were advised to look upon Mexico as an object lesson. Though not distinctly so expressing it, the manifesto leaves it to be inferred that the Society of Peace desires to see the re-establishment of monarchy in China. The following day the *Asia Jih Pao*, a vernacular paper of some standing, published the following alleged statement by His Excellency the President:—

"The proposals made by the said Association do not attract much of my attention, as statements of this nature have been in circulation long before the organization of what is called the Society of Peace.

"It may be said that since the outbreak of the war in Europe, the world opinion regarding the system of government has been somewhat modified. The present civil war waged in the Republic of Mexico has roused many intelligent people to ponder over the problem of safety and danger in connection with a newly founded republic and to study the advantage and disadvantage of a republican form of government. Nevertheless, as to my present position and in my way of looking at things, I must say that since we have adopted the republican form of government, we should continue the same system of administration, and it will not be right to contemplate the adoption of any other form of government.

"Some days ago a certain scholar called on me and thoroughly discussed the advantage and disadvantage of both the monarchical and republican forms of government. In response to his inquiry I said as to the functions of the President of a Republic and the exact form of government a country should adopt, it is too great a question and would take some time to study before a solution can be found. In my opinion, the fundamental principle of the Republican Government is to represent the public opinion of the people and to plan with whole efforts the greatest welfare of the

greatest number of the people. As the society in question does not in the least conflict with the fundamental principle of the Republican Government, how can I interfere with its work?

"Repeatedly I have expressed to the public my ambition and my opinion regarding the adoption of a monarchical government. Again shall I declare that I am unwilling to become an Emperor, even if the circumstance requires. Nor am I ambitious for the retaining of the office of the President. I have no love for this post, so long as I have cherished my ambition to retire and resort to places among mountains and waters where I can enjoy beautiful scenery and the teachings of nature. This thought I cannot abandon for a moment. Therefore, with regard to the planning and procedure of the said society, personally I have no prejudice or suspicion whatever.

"In attending to the administrative affairs of the Government, I cannot at the same time disregard the welfare of my family and security of my life and property. Likewise, it is the duty of each citizen to look after the prosperity of his children and kinsmen. How much more important is the problem of planning for peace and prosperity for 400 millions of people? The principal object of the society is to plan peace for the whole people of China, and its intention is therefore wholesome without question. Since I have received the sacred trust of the people, how can I unrightfully interfere with the activity of the association, the aim of which is for the good of the people. Moreover, an important question of this nature ought to be studied by the scholars of the country. In conclusion, I must say that since this society does not in any way cause disturbance in the country, it is not likely that I shall object to its existence."

On August 18 an interview with Professor Goodnow appeared in the *Peking Gazette*, in which Dr. Goodnow disclaimed the uncompromising advocacy of the monarchical system that had been attributed to him. He said that he had never declared that a monarchical system of government was superior, but that on the contrary he was of opinion that no form of government could be said to be superior *under all conditions* to other forms of government. In some countries—the United States and France for example where the grade of intelligence was high and the people had learned the art of self-government by participating in the work of government—a republican form of government was the best. On the other hand a monarchy was often better suited for countries where conditions were different from those obtaining in the United States and France. In China the conditions made difficult the orderly development of republican government, on account, among other things, of the general lack of knowledge of the people and their long subjection to autocratic rule. The re-establishment of a monarchy in

China could only be justified because under a monarchy the question of succession to the executive power might possibly be more satisfactorily solved than was probable under any sort of republican government that was likely to be established in this country. A monarchical restoration in China would in his opinion be justified only on conditions.—

(a) That the change be acceptable both to the thinking people of China and to the Foreign Powers in order that it might not meet with such opposition as would lead to disorder.

(b) That the succession to the throne be so fixed that no doubt could arise on the death of the monarch as to who would succeed. If we might judge from the European experience the only proper method of fixing the succession was to give it to the eldest son of the monarch or in default of sons to the eldest male relative.

(c) That the monarchy established be a limited constitutional monarchy, which, while for the moment vesting large powers in the Crown, would permit of the gradual development of greater popular government. The re-establishment of the former autocratic monarchy in China could not be regarded as promising any improvement over present conditions.

Dr. Goodnow declined to say whether those conditions could be met at present in China on the ground that he did not know enough about the country or of Chinese opinion, and he would, therefore, leave that question to be answered by those who did know China's conditions and were responsible for her destinies.

Apparently Dr. Goodnow, while anxious not to appear to advocate a reversion to monarchy, is personally of belief that the change would be in the best interests of China. At all events he is not opposed to a monarchical restoration. It has to be remembered that Dr. Goodnow, while a citizen of a republic, would not allow that fact to influence any recommendation that he might make as an Adviser. He would recommend what he conscientiously believed best in the conditions that prevail in China. The view that he takes, namely, that, if the best informed Chinese deem that the change would be conducive to the interests of the Chinese people, it should be made, is one that will commend itself to most foreigners. The interests of the people is the chief, in fact the only, consideration, and, if the people are likely to secure better protection for life, liberty and property under an Emperor than a President, republican fetishism should not be allowed to be an obstacle. On the other hand if better protection for life, liberty and property would not be secured, the change would be unnecessary and irrational.

MEMORANDUM SUBMITTED BY DR. GOODNOW TO YUAN SHIH KAI

The memorandum on governmental systems submitted by Dr. Goodnow to President Yuan Shih Kai has been made available, and we now reproduce it textually.—

The determination in a given country of the form of government established therein has seldom if ever been the result of the conscious choice of the people of the country or even of the choice of its most intelligent classes. The establishment on the one hand of a monarchy or on the other hand of a republic has in almost all instances been due to influences almost beyond human control. The former history of the country, its traditions, its social and economic conditions all have either favoured the form of government which has been adopted or, in case the form of government at first adopted has not been in harmony therewith, have soon brought it about that that form is replaced by one which is better suited to the country's needs.

In other words, the form of government which a country usually possesses is for the most part determined by the necessities of practical life. Among the contributing causes which fix forms of government, one of the most important is force. Almost all monarchies thus owe their origin in last analysis

to the exertions of some one man who has been able to organise the material power of the country in such a way as to overcome all competitors. If he has able sons or male relatives, if he has ruled wisely and if the conditions of the country have been such as to favour monarchical rule, he may be able to establish a dynasty which will during a long period successfully govern the country.

Under such conditions one of the most perplexing problems of government is probably more satisfactorily solved than has usually been the case in republics. For on the death of the monarch there is no question as to the succession to the executive power. No election or other method of choosing a successor is necessary. As the English law expresses it: "The King is dead, Long live the King." In order however, that the desired result may be attained, it is absolutely necessary that the law of succession be clearly determined and practically universally accepted. Else the death of the monarch will bring into being numerous aspirants for the throne whose conflicting claims can be adjudicated only by resort to civil war.

History would seem to prove, furthermore, that the only permanently satisfactory solution of the question of succession in monarchical states is that which has been reached by the states of Europe. This consists in fixing the

succession to the throne upon the eldest son of the monarch or in default of sons, upon the nearest oldest male relative. Under this method he who is by the law of succession entitled to the throne is permitted to waive his rights, in which case, if it is the eldest son who has so waived his rights, the next eldest son takes his place.

If some such method of fixing the succession is not adopted, if for example the succession to the throne is left to the determination of the monarch, who may choose as his successor a son not the eldest, or some other relative not the nearest eldest male relative, the uncertainty as to the succession is almost certain to produce trouble. Palace intrigues in favour of the various claimants to the throne are sure to develop which both embitter the closing days of the monarch's life and often lead to confusion if not civil war after his death.

The advantages which history would seem to show are attendant upon a monarchy as compared with a republic, so far as concerns this important question of succession to the executive power, are thus, it would seem, conditioned very largely upon the adoption of that law of succession which experience has shown to be the best, that is succession in the eldest nearest male line.

European Republics

Until recently the accepted form of government both in Asia and Europe was monarchical. It is true that in Europe, contrary to the usual rule, there were a few republics, such as Venice and Switzerland. But the states possessing a Republican Government were few in number and small in size. In almost all the important states of the world the government was monarchical in character.

Within the last hundred and fifty years, however, there is noticeable among European peoples a distinct movement away from monarchical and in favour of Republican Government. The first attempt to establish Republican Government in any of the large European states was made in England in the 17th century. After a successful revolution Charles I, the English King, was tried by Parliament, convicted of treason and executed. A republic, the so-called "Commonwealth," was established with Oliver Cromwell as "Protector" or President. Cromwell obtained his power as a result of his control of the revolutionary army which had defeated the forces of the crown.

This Early English republic lasted only a few years and fell as a result of the difficulties attendant upon the question of the succession to the Protectorate which arose on Cromwell's death. Cromwell had attempted to place his son Richard in the position left vacant by his death. But either because the English people were not suited to a republic or because Richard Cromwell did not have the characteristics required of the possessor of executive power, this attempt to continue the English republic was a failure, and England abandoned the republican and re-established the monarchical form of government. Charles II, the son of the executed Charles I, was put upon the throne, largely as the result of the support of the army but with the almost universal approval of the English people.

The next attempt to form a republic among European peoples was made after the American revolution at the end of the 18th century when the United States of America was formed. The American revolution was due not so much to an attempt to overthrow monarchical government as to a desire upon the part of the English colonies in America to obtain their independence of England. The success of this revolution brought, however, in its train, almost necessarily, the establishment of republican government. There was no royal family left in the country to which its government might be entrusted. There was, furthermore, in the country a distinct sentiment in favor of a republic due in large measure to the fact that quite a large number of those who had participated in the establishment of the ill-fated English republic in the preceding century had come to America and had exerted even after their death an influence in favor of republican institutions.

It is, however, possible that George Washington, who had led the American armies during the revolution, might have if he had been so inclined, established himself as king. He was, however, in principle a republican rather than a monarchist. He furthermore had no son who, had he been crowned king, could have succeeded him.

The result was that, when the United States obtained its independence, it definitely adopted the republican form of government which has lasted during a century and a quarter. The unquestioned success which has attended the United States during most of its existence has done much to give to the republican form of government the prestige which it now possesses. It is well, however, to remember that the United States inherited from England the principles of constitutional and parliamentary government and that these principles had been applied in America for a century or more before the republic was established. The change from the form of government which was in force during the colonial period to the republic adopted in 1789 was not therefore anything in the nature of

a change from autocracy to a republic. Such change as was made had been preceded by a long period of preparation and discipline in self-government. Furthermore, the American people even of that day possessed a high grade of general intelligence, owing to the attention which had from the very beginning of American history been given to the common schools, where almost every child could learn at any time to read and write.

The French Revolution.

The establishment of the American Republic was followed almost immediately by the formation of the French Republic. The government of France prior to the declaration of the republic had been autocratic. Almost all public powers were centered in the crown and the people participated hardly at all in the administration. The French people had thus had little experience in self government and were therefore unable to carry on successfully the republic which they endeavored to establish. Periods of disorder followed by military dictatorships followed in rapid succession. The monarchy was restored after the fall of Napoleon largely as the result of foreign intervention. A revolution in 1830 brought into being a more liberal monarchy. This was overthrown by a revolution in 1848, when a republic was again established. The President of this Republic, the nephew of the great Napoleon, overthrew it and declared himself Emperor. After the Franco-Prussian war in 1870, he was deposed and the present French Republic came into being. This republic has now lasted nearly half a century and gives every evidence of permanence.

It is well to remember, however, that the present permanence of republican institutions in France was secured only after nearly a century of political change, if not disorder, and that during that century serious attempts had been made both to give the people generally that education upon which intelligent political action must be based and to accustom them by participation in public affairs to the exercise of powers of self government.

The French, like the Americans, would appear to have solved successfully the most difficult problems in republican government, that is the succession to the executive power. In France the President is elected by the legislature. In the United States he is elected by the people. In both France and the United States the people have had long experience in self government through participation in public affairs, while in both countries, during the past half century particularly, great attention has been paid to their general education through schools in many cases supported by the government. The result is that the grade of intelligence of the people in both America and France is, comparatively speaking, high.

The Latin Republics.

The examples given in the latter part of the 19th century by the United States and France were very largely followed in South and Central America at the time the former Spanish colonies in this part of the world achieved their independence. As was the case in the United States when it became independent a republic seemed the only practicable form of government which could then be adopted. There was no royal family to which the people might look for guidance.

The success which had been attendant upon the establishment of a republic in North America had caused the belief to be entertained by many thinkers, both that a republic was the best form of government and that its establishment and maintenance were possible under all conditions and among all peoples. Republics were therefore established almost everywhere throughout South and Central America. But, either because of the disorders which were incident to the long struggle for independence or because of the difficulties inherent in a republican form of government among a low grade of intelligence, due to the lack of general education, and accustomed only to autocratic

rule, the South and Central American republics have not been generally successful. For years after the independence of the Spanish colonies was achieved South and Central America was the scene of continual disorder, incident for the most part to the struggles of military leaders for political power. At times there were periods of comparative peace due to the success of some extraordinarily strong man who was able to seize and keep in his hands political power. Little if any attempt was for a long time made by any of those who obtained political power to educate the people generally through the establishment of schools or to aid them in the acquisition of political experience by according them participation in the government. The result was that when the strong hand which controlled the country was relaxed, owing either to the increasing age or death of him who possessed political power, disorder again appeared, due to the struggles of the claimants for the political succession—since no satisfactory solution of the question of succession was reached. Whatever progress the country had been able to make during its period of peace was arrested and not infrequently the anarchy and chaos which followed caused a serious deterioration in the economic and social conditions of the country.

What has happened in Mexico recently has too often been the lot of the Central and South American States under a republican form of government not suited to their stage of economic and political development. Under the government of Diaz, who acquired political power through his control of the army, it seemed as if Mexico had successfully solved the problem of government. Diaz, however, did little for the education of the people and discouraged rather than encouraged their participation in the government. When increasing age caused him to relax his control, revolution broke out again and he fell from power. Since his loss of power the country has been devastated by the contending armies of rival leaders, and at present it would seem that its salvation is possible only as the result of foreign intervention.

It is of course true that in some of the South American countries progress is apparently being made in solving the problems of republican government. Such countries are particularly Argentina, Chile, and Brazil. In both Argentina and Chile a long period of disorder and disturbance has been followed by a comparatively long period of peace. In Brazil the establishment of the republic, about twenty-five years ago, was accompanied by little trouble and the subsequent life of the republic has been a peaceful one. In all three countries considerable progress has been made in the establishment of constitutional government, in Argentina and Chile as one of the results of the struggles of the early part of the nineteenth century, in Brazil, partly at any rate, during the Empire which preceded the present republic, and which encouraged the participation of the people in the government of the country.

Lessons from Republican Experience.

The experience of the South and Central American countries would seem to inculcate the same lessons which may be derived from the experience of the United States and France. These are

1st.—That the difficult problem of the succession to executive power in a republic may be solved by a people which has a high general intelligence due to the existence of schools where general education may be obtained and which has learned to exercise political power through participation in the affairs of government; and

2nd.—That little hopes may be entertained of the successful solution of the question of Presidential succession in a country where the intelligence of the people is not high and where the people do not acquire political wisdom by sharing in the exercise of political power under some form of constitutional government. Where such conditions do not exist a republican form of government—that is a government in which the executive is not hereditary—

generally leads to the worst possible form of government, namely, that of the military dictator. The best that can be hoped for under such a system is periods of peace alternating with periods of disorder during which the rival claimants for political power are striving among themselves for the control of the government.

Great Powers Will Not Permit Disorder.

At the present time, it may further be remarked, it is very doubtful whether the great powers of the European world will permit the government of the military dictator permanently to exist, if it continues to be accompanied by the disorder which has been its incident in the past. The economic interests of the European world have grown to be so comprehensive, European capital and European commercial and industrial enterprises have become so wide in their ramifications that the governments of the foreign countries interested, although caring little what may be the form of government adopted by the nations with which they deal, are more and more inclined to insist, where they have the power, that conditions of peace shall be maintained in order that they may receive what they consider to be the proper returns on their investments. This insistence they are more and more liable to carry to the point of actual destruction of the political independence of offending nations and of direct administration of their government if this is necessary to the attainment of the ends desired.

It is therefore becoming less and less likely that countries will be permitted in the future to work out their own salvation through disorder and revolution, as may have been the case during the past century with some of the South American countries. Under modern conditions countries must devise some method of government under which peace will be maintained or they will have to submit to foreign control.

China's Needs Considered.

The question naturally presents itself: How do these considerations affect the present political situation of China?

China is a country which has for centuries been accustomed to autocratic rule. The intelligence of the great mass of its people is not high, owing to the lack of schools. The Chinese have never been accorded much participation in the work of government. The

result is that the political capacity of the Chinese people is not large. The change from autocratic to republican government made four years ago was too violent to permit the entertainment of any very strong hopes of its immediate success. Had the Tsing dynasty not been an alien rule which it had long been the wish of the Chinese people to overthrow, there can be little doubt that it would have been better to retain the dynasty in power and gradually to introduce constitutional government in accordance with the plans outlined by the commission appointed for this purpose. But the hatred of alien rule made this impossible and the establishment of a republic seemed at the time of the overthrow of the Manchus to be the only alternative available.

It cannot, therefore, be doubted that China has during the last few years been attempting to introduce constitutional government under less favorable auspices than would have been the case had there been a royal family present which the people regarded with respect and to which they were loyal. The great problem of the Presidential succession would seem still to be unsolved. The present arrangement cannot be regarded as satisfactory. When the present President lays down the cares of office there is great danger that the difficulties which are usually incident to the succession in countries conditioned as is China will present themselves. The attempt to solve these difficulties may lead to disorders which if long continued may seriously imperil the independence of the country.

What under these conditions should be the attitude of those who have the welfare of China at heart? Should they advocate the continuance of the Republic or should they propose the establishment of a monarchy?

These are difficult questions to answer. It is of course not susceptible of doubt that a monarchy is better suited than a republic to China. China's history and traditions, her social and economic conditions, her relations with foreign powers all make it probable that the country would develop that constitutional government which it must develop if it is to preserve its independence as a state, more easily as a monarchy than as a republic.

But it is to be remembered that the change from a republic to a monarchy can be successfully made only on the conditions:—

1st.—That the change does not meet with such opposition either on the part of the

Chinese people or of foreign powers as will lead to the recurrence of the disorders which the present republican government has successfully put down. The present peaceful conditions of the country should on no account be imperiled.

2nd.—The change from republic to monarchy would be of little avail if the law of succession is not so fixed that there will be no doubt as to the successor. The succession should not be left to the Crown to determine for the reasons which have already been set forth at length. It is probably of course true that the authority of an emperor would be more respected than the authority of a president. The people have been accustomed to an emperor. They hardly know what a President is. At the same time it would seem doubtful if the increase of authority resulting from the change from President to Emperor would be sufficient to justify the change, if the question of the succession were not so securely fixed as to permit of no doubt. For this is the one greatest advantage of the monarchy over the republic.

3rd.—In the third place it is very doubtful whether the change from republic to monarchy would be of any lasting benefit to China, if provision is not made for the development under the monarchy of the form of constitutional government. If China is to take her proper place among nations greater patriotism must be developed among the people and the government must increase in strength in order to resist foreign aggression. Her people will never develop the necessary patriotism unless they are given greater participation in the government than they have had in the past. The government never will acquire the necessary strength unless it has the cordial support of the people. This it will not have unless again the people feel that they have a part in the government. They must in some way be brought to think of the government as an organization which is trying to benefit them and over whose actions they exercise some control.

Whether the conditions which have been set forth as necessary for such a change from republic to monarchy as has been suggested are present, must of course be determined by those who both know the country and are responsible for its future development. These conditions are present if there can be little doubt that the change would be of benefit to the country.

ASPHALT IN LEYTE—THE NEW PHILIPPINE OIL FIELD

The deposits of asphalt in Leyte, which have been reported by the local press from time to time during the past year, have recently been examined by the Chief of the Division of Mines of the Bureau of Science, and the following preliminary statement sets forth the principal results of the examination.

It will be recalled that asphalt was first reported from Leyte a little more than a year ago, having been discovered by a Filipino ranger employed by the Bureau of Forestry. The original discovery was made near the head of the Butason River in a region about 10 kilometers distant from the barrio of Campoc-poc on the north-western coast of the island. The outstanding feature of the recent official examination is the discovery of a large deposit of bituminous limestone, or, as it is more commonly called, rock asphalt, near the town of Villaba and at a point very much closer to the sea coast than the original discovery. At the beginning of the present year prospectors learned that unimportant quantities of semi-liquid asphalt were seeping from small holes in the wall of a cañon near Villaba, but they believed the occurrence to be of little value because of the small quantity of the material found. The fact that the whole rock face was impregnated with asphalt was not detected previous to the official investigation. Although the deposit has not been explored by artificial

openings it is well exposed by the deep cañon and there is little question that the quantity of material present is to be measured in thousands of tons. The upper 6 meters of the rock asphalt which occurs in thick beds is a bituminous, sandy limestone while an equal thickness at the base is bituminous sandstone.

Other important discoveries made by prospectors themselves have revealed deposits of greater extent than the original discovery which consists of only a small pocket. Taking into consideration the first findings and the results of the subsequent prospecting, outcrops of various grades of asphalt, including solid, viscous and liquid types, together with seeps of the petroleum from which the asphalt has been derived, are known to occur over an area about 20 kilometers in length. The more important discoveries, however, are limited to an area about 13 kilometers in length.

Perhaps the greatest importance of the Leyte asphalts is their significance as to the presence of petroleum in the rocks from which they escape. It is unquestioned that asphalts originate from petroleum through the loss of the more volatile oils and the concentration of the heavier residual matter. Thus it is that the finding of asphalt in Leyte makes certain the former presence of petroleum in the adjacent rocks. This is important, not only in connection with the Leyte region, but also because it

bears upon the petroleum field of Bondoc Peninsula, Tayabas Province. Those who have been interested in petroleum will recall that the report on the Bondoc petroleum field, issued by the Bureau of Science some time ago stated that there was no question as to the existence of petroleum in Tayabas, but that there was a question as to the quantity of petroleum present and a further question as to whether conditions were such that the petroleum would flow readily from wells in case wells were drilled. The examination of the Tayabas petroleum field and the recent examination of the asphalt deposits in Leyte have been made by the same man, and it develops that the rock series in the two regions are identical; that is to say, the one field may be considered as a detached portion of the other. In Tayabas the petroleum was found to come from the upper part of a series of thin bedded shales called, for convenience, tuff-sandstone and this, in turn, by calcareous sandstone and limestone. In Leyte exactly the same rocks are found, the Vigo shales at the base of the series overlain by a tuff-sandstone, calcareous sandstone, and limestone.

There is one point of difference in the two fields, however. In Tayabas petroleum was actually found only in the upper members of the Vigo shales, although, to be sure, its presence was suspected at other horizons. In

Leyte petroleum or asphalt which has resulted from the dissipation of petroleum is found at several horizons from the base to the upper part of the Vigo shales, in the overlying tuff-sandstone and, finally, in the calcareous sandstone and limestone at the top of the rock series. Moreover, the quantity of asphalt and bituminous limestone in Leyte is large enough to make it certain that the quantity of petroleum originally present in the formations must also have been of commercially important proportions. From this it may be deduced with a considerable degree of probability that the quantity of petroleum in Tayabas is likewise important.

Similar to Tayabas Field

There remains, however, an uncertainty as to whether or not petroleum can be obtained in commercial quantities in either field by the common method of drilling wells into the rocks. Both in Tayabas and in Leyte the oil bearing rocks are extremely fine grained, and it is not at all certain that the petroleum moves freely enough in these fine grained rocks to flow readily into wells. Because of this, it was anticipated in the case of the Tayabas field that individual wells would be small producers and would probably not flow of their own accord, but would require pumping. The same condition holds in Leyte.

The question will at once be asked, how it is that the large quantities of petroleum necessary for the accumulation of the various asphalt deposits of Leyte could have been driven to the surface unless there is an equally strong probability of obtaining large quantities of petroleum by drilling wells into the same rocks. The answer as revealed by the examination just made, is that the petroleum which gave rise to the asphalt deposits was forced out of the containing rocks by the subsequent intrusion into these rocks of numerous bodies of molten or semi-molten igneous rock. The petroleum bearing rocks in Leyte are cut through at many places by small bodies of igneous rocks, and it is conceived that these intrusions in their original heated condition distilled the petroleum from the shale and drove it to the surface along fractures and bedding planes. Obviously the mere penetration of the petroleum bearing rocks by wells would be a less efficient method of removing the petroleum than nature has employed.

The Tayabas oil is an extremely light oil with a high percentage of gasoline. The appearance of representative samples of the Leyte petroleum taken by the geologist during the recent examination indicates that it is also a light oil, although it will probably be found to be somewhat heavier than the Tayabas oil. The fact that both oils have a paraffin base and come from the same rocks makes it certain that they are related in origin.

Field Merits Attention

It is inevitable in the light of the foregoing statements that the matter of drilling for petroleum in Leyte should receive attention. In this connection, it is impossible from the data so far obtained to draw conclusions as definitely as is desirable. More work must be done before it is possible to say whether the chances of obtaining petroleum in commercial quantities in Leyte justify drilling, and a great deal more work must be done before it will be possible to indicate the proper locations for exploratory wells. The fact that the oil bearing rocks have been broken through by later intrusives makes the question a complex one. Similar conditions obtain in Mexico, where there has recently been developed one of the most important petroleum fields in the world. There, many wells have been drilled adjacent to petroleum seeps which occur at the contact of the intrusion with the sedimentary rocks. The proper location of the Mexican wells is, therefore, a simple matter. In contrast with the results of exploration in the Mexican field,

however, there are numerous other regions where asphalt occurs as it does in Leyte, but where all attempts to obtain the petroleum from which the asphalt is derived have failed.

It is a foregone conclusion that the proper exploration of the Leyte petroleum deposits, if it be advisable at all, will be an expensive undertaking. It is highly probable that a series of wells would have to be drilled before the true character of the formations could be ascertained with sufficient exactness to ensure any degree of certainty of success in the location of new wells, and the ultimate failure of all attempts is a possibility to be kept in mind. The enterprise is one, therefore, which calls for backing by large capital.

Even though no petroleum is obtained in Leyte, some of the deposits of asphalts are in themselves of possible commercial importance. In the first place, it may be possible to use the rock asphalt at Villaba as a paving material. Chemical analyses now being made will throw more light on this possibility, but the question must be determined finally by actually paving a section of some street with this material.

Plan Practical Test

There is reason to believe that the Bureau of Public Works, in co-operation with the holders of the mineral claims, will make such an experiment. If the material can be successfully employed for paving, it will undoubtedly find a considerable market in the Philippines themselves, and it might be exported to the China coast and to Japan. Rock asphalt is not extensively used as a paving material in the United States largely because of the abundance and consequent cheapness of true asphalt. In Europe, however, there are millions of square meters of rock asphalt pavement. Indeed, in France and Italy rock asphalt is the standard paving material. Italy, for instance, uses annually about 200,000 tons of rock asphalt, valued at more than a million pesos.

A prominent American engineer and chemist has written a standard reference book in which the usefulness of rock asphalt as a paving material is belittled, and his conclusion has undoubtedly been instrumental in deterring American engineers from the use of rock asphalt. In spite of this, however, rock asphalts of Oklahoma which were particularly denounced in the book referred to are now being used successfully and have proven to be one of the best paving materials obtainable. Even in California, where true asphalt, obtained as residual from asphaltic petroleum, is so abundant as to be almost a drug on the market, more than 27,000 tons of rock asphalt, worth five pesos a ton, was used in 1913.

In case it develops that the Leyte rock asphalt is not suitable for paving, there is still a possibility of using some of the purer asphalt for the manufacture of paraffin and other products, such as bituminous paints and varnishes. Asphalts which can be used for varnishes are worth about 35 pesos a ton in the United States. Ozocerite, from which large proportions of paraffin are obtained, is worth from ten to fifteen centavos per pound in the United States. Thus, it appears that asphalts high in paraffin command even a better price than true asphalts. Of course, the market for the derived products, such as paraffin and varnishes, would be limited in the Philippine Islands, but exportation to China and Japan is at least a possibility. It is true also that more capital would be required to establish an industry if the Leyte asphalt must be refined and manufactured than if it can be sold in the crude state for paving purposes.

To Solve Full Problem

If petroleum can be obtained either in Tayabas or in Leyte in quantities sufficient to make it a competitor with coal as a fuel, a great problem will have been solved. The biggest local field for a fuel oil would be the inter-

Island shipping. If ships could obtain a fuel oil at a price which would make its use comparable in cost with the use of imported coal, there is no doubt but that the inter-Island boats would be equipped to burn oil instead of coal. The railroads, likewise, would undoubtedly prefer petroleum to coal in their locomotives. Several of the mines in Masbate are already using fuel oil, although they have to import it from Sumatra and Borneo.

Gasoline and kerosene are used in considerable quantity in the Philippines. The imports of crude oil, naphtha, illuminating oil, lubricating oil, and residuum during the calendar year 1914, according to the annual report of the collector of Customs, amounted to p. 3,642,078. This sum represents the magnitude of the established market only exclusive of the increased demand which would be inevitable if petroleum could be obtained in competition with coal as a fuel. The enterprise which is successful in developing Philippine petroleum and refining it locally in competition with foreign manufacturers will control a market of no mean proportions without the necessity of any exportation.

According to the *Manila Daily Bulletin*, the chemical analyses have been completed upon representative samples of the deposit of rock asphalt discovered by the Division of Mines, Bureau of Science, in Leyte, and the results justify the hopes already expressed that this material would prove suitable for paving purposes. Samples of the poorer rock, according to analyses just completed, contain 6 per cent. of bitumen. The average rock contains from 7 to 9 per cent. bitumen, and rich portions near the base of the deposit contain as much as 62 per cent. bitumen. The analyses show further that the bitumen consists largely of asphaltene and that the proportion of paraffin, a constituent which is undesirable in asphalt for paving, amounts to less than one half of one per cent. of the total bitumen. The results of the analyses tend to remove the doubt which has been felt as to the possibility of using the Leyte rock asphalt for paving.

The purer bitumens in Leyte, associated with the rock asphalt, are known to be high in paraffin and to form brittle solids unsuitable for pavement, but the rock asphalt itself appears to be free from these objections and to be very similar, so far as analyses reveal its character, to rock asphalts which are successfully used for paving in the United States and Europe.

It is probable that a trial pavement will be constructed from the Leyte rock asphalt upon which observations can be made to determine absolutely the suitability of this material for paving. If the results of this experiment are favorable, it ought to be possible to use the Leyte rock asphalt in paving the streets of Manila and other Philippine cities, and the deposit, consequently, assumes considerable importance.

The chemical investigation of other bituminous materials in Leyte also shows that valuable products, such as lubricating oils, kerosene, and even some gasoline, can be distilled from a bitumen-clay mixture which is present in an apparently large deposit. These results indicate the possibility of establishing a distillation industry similar to the distillation of kerosene shale in Scotland and in New South Wales. The character and the quantity of the distillation product obtained from the Leyte material compares favorably with the results of commercial distillation in these other countries.

The distillation of kerosene shales in Scotland has been carried on for many years, and in New South Wales government aid in the form of a bounty or premium on the products of distillation has led to a considerable growth of shale distillation in that country in recent years. It is hoped that the Leyte deposits can be utilized in the same manner.

THE PHILIPPINE RAILWAY COMPANY

[Ninth Annual Report to December 31, 1914]

Following is the Ninth Annual Report of the Philippine Railway Company, operating lines in Cebu and Panay Islands for the year 1914.

No bonds were issued during the year, the total issue having been completed and the construction accounts closed during the year 1913. The total issue of four per cent guaranteed bonds covering all construction expenditure in accordance with the terms of the concession is \$8,551,000.

Torrens titles have been obtained of the right of way on Panay through the Province of Capiz, 49.5 kilometers, and on Cebu through the two friar estates, 12.5 kilometers. The case covering the section through the Province of Iloilo will be heard by the Land Court on March 1st, 1915. The issue of registered titles

1915 three locomotives will require heavy repairs. Four third-class passenger cars and twenty-one freight cars were rebuilt as to wood work, or received heavy repairs during the year. In 1915 the wood work on eleven third-class and thirty-eight freight cars will have to be renewed. Transportation expenses show a saving of \$12,702.14 over 1913, due almost entirely to decreased coal consumption.

Station and Train Service:

All dispatchers, station agents and train employees are Filipinos, with the exception of one American conductor and one American engineman. No change has been made in train schedules during the year. Conditions are such as to make it advisable to handle both passengers

the number of passengers increased 15.4 per cent, and tonnes freight increased 55.7 per cent.

Sugar Crop Increases

On Panay agricultural conditions have been good, except for the rice crop on the south end, which fell about 25 per cent below normal on account of dry weather and insects. This will affect to some extent the business of next year. Sugar production on Panay is next in importance to rice. During the year a number of small mills were erected and efforts have been made to secure government funds for the erection of a central along the line of the railway, but no decision has yet been reached. A decided impetus has been given to sugar production



MARKET DAY AT SANTA BARBARA.



CORN DEMONSTRATION IN MARKET.

throughout the islands proceeds very slowly, and while every effort has been made to have our applications acted upon, we were unable to secure the titles during this year. It now seems probable that all titles will be issued early in 1915, with the exception of the section of right of way in the City of Cebu and its suburbs, where, due to the very large number of cases involved, there will probably be a longer delay.

Maintenance Costs Lower

As compared with the previous year there was a decrease of \$33,527.04 in the cost of Maintenance of Way and Structures. Expenditures during 1913 were unusually large, due to renewing with creosoted piling the long approaches to bridges on Panay, the replacing of bridges washed out by the typhoon of 1912, and other heavy maintenance work due to the same cause. It is expected that tie and telephone pole renewals will be the only items of maintenance expense which will increase during the coming year.

No increase was made to the equipment during the year. One ballast car, carried away or buried in the Talisay Gravel Pit by the high water of October, 1912, was written off the books. This was not written off earlier as we are still taking ballast from the same pit and considered there was a possibility of recovering the car.

The cost of maintenance of equipment was \$5,862.55 less than during the previous year, the largest items of saving being on locomotive and ballast car repairs, Panay. The original pine wood work on a number of freight cars will have to be renewed with native hard wood during 1915. During 1914 five locomotives received thorough overhauling. For the year

and freight on all trains. On the Cebu Division four trains in each direction daily between Carcar and Cebu; and two trains in each direction daily between Cebu and Danao and between Carcar and Argao. On the Panay Division between Iloilo and Capiz there are two trains in each direction daily; and between Iloilo and Passi, and between Dumarao and Capiz, there are two additional trains daily in each direction.

During the year one trespasser was killed and one injured by passing trains. No employees were injured. There were no train accidents of sufficient importance to be reported.

Coal consumption shows a decided decrease over the previous year, due to purchases having been made on the basis of fuel efficiency, and a system of prizes to train crews for economical consumption. As compared with 1913 the cost and consumption of fuel used by locomotives was as follows:

	1914	1913
Total value of coal on tank	\$36,427.13	\$47,985.83
Total locomotive coal consumption (kgms.)...	6,839,021	8,610,715
Coal consumption per locomotive kilometer (kgms.)	13.76	16.44
Coal consumption per 100 tonne kilometers(kgms.)	9.80	11.95

The traffic rules were re-published during the year with all modifications made by Traffic Orders since the previous issue in 1909. The traffic organization continues as heretofore, to assist in every way possible in the development of the country through which the lines pass. During the year 12.1 per cent more passengers and 18.8 per cent more tonnes of freight were handled than during the previous year. The improvement is more marked on Panay, where

on account of an expected rise in prices due to the European War.

Conditions on Cebu during the first seven months of the year were much improved over 1913, total operating revenues increasing 18.3 per cent over the same period of the previous year. For the last five months of the year the revenues decreased 8.8 per cent as compared with the last five months of 1913. The European War seriously affected the hemp and copra trade at the port of Cebu, there being no market for these products for several months. Agriculture also suffered severely from lack of rain. It does not seem probable that present conditions will be much improved during the coming year.

Auxiliary Operations

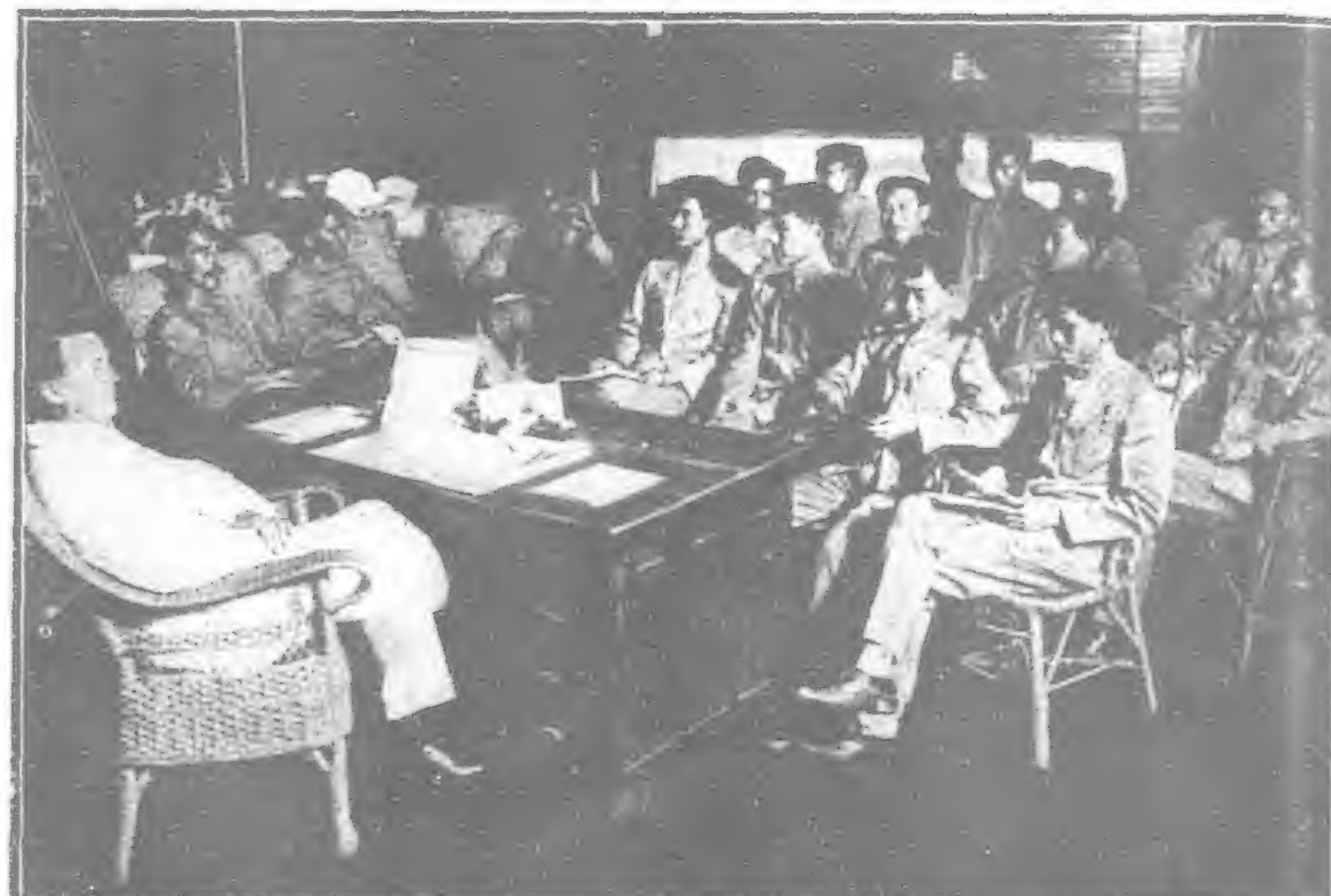
The Launch "Drake" and Lighter "Carlos" were both retired from service during the year. The boiler and engine of the "Drake" are in very good condition, and we are endeavoring to dispose of them. A thorough inspection of the hull shows that the expense of overhauling will practically equal the cost of a new boat, and it is not believed the expenditure is advisable.

All the plates of the "Carlos" are very thin, and the bottom was in such shape three years ago that it was necessary to put in a layer of cement. She was in a heavy gale on the coast of Negros the latter part of the year and was badly battered against the shore. The pounding she was subjected to broke to pieces the cement, further damaged the bottom plates, and so injured the entire vessel that it will not pay us to make repairs.

These boats were purchased in 1908 and undoubtedly paid for themselves during con-



FIESTA TRAIN ARRIVING AT CEBU STATION WITH 1200 PASSENGERS.



AGENTS' NIGHT SCHOOL, CEBU DIVISION.

struction in the saving in cost of transporting company material.

The principal items of Additions and Betterments were the lengthening of the Talisay Bridge, Cebu, by four 20-foot spans, at a cost of \$2,081.98; raising and lengthening bridges and raising track Kilometer 44.65 to Kilometer 46.12, Cebu, at a cost of \$1,486.20, to provide additional water way for flood drainage channel constructed by the Government; and laying two commercial side tracks, Panay, at a cost of \$752.24.

LIABILITIES

Capital stock—common	\$5,000,000.00
Mortgage bonds	8,551,000.00
Audited vouchers and wages unpaid	\$ 21,252.14
Other working liabilities	1,713.51
	22,965.65
Advances by Philippine Government to meet bond interest ..	1,807,718.45

APPROPRIATED SURPLUS:

Additions to property through income	\$ 35,407.55
Reserve for extraordinary emergencies	75,000.00
	110,407.55

INCOME ACCOUNT

<i>Rail Operations—Revenues:</i>	
Freight Revenue ..	\$112,899.88
Passenger Revenue ..	220,711.84
Excess Baggage Revenue ..	959.28
Mail Revenue ..	5,439.24
Express Revenue ..	5,578.94
Switching Revenue ..	4,848.87
Total Revenue from Transportation ..	\$350,438.05
Station and Train Privileges ..	\$ 6.00
Storage—Freight ..	84.63
Rent of Buildings and Other Property ..	3,580.23
Miscellaneous ..	7,122.09

Total Revenue from Operation
Other than Transportation .. 10,780.95

Total Operating Revenue .. \$361,219.00

Rail Operations—Expenses:

Maintenance of Way and Structures ..	\$ 51,150.57
Maintenance of Equipment ..	45,940.13
Traffic Expenses ..	8,301.84
Transportation Expenses ..	97,950.52
General Expenses ..	29,451.93

Total Operating Expenses .. 232,794.99

Net Revenue—Rail Operations .. \$128,424.01

TRAFFIC STATISTICS

All Divisions, Year Ended December 31, 1914.

	1914	1913	Increase or Decrease	Per Cent
<i>Passenger:</i>				
Total Number Carried	1,188,461	1,059,697	128,764	12.15
First Class	3,167	5,727	2,560*	44.70*
Second Class	186,717	167,704	19,013	11.34
Third Class	998,577	886,266	112,311	12.67
Number Carried One Kilometer ..	27,185,933	24,493,733	2,692,200	10.99
Average Distance Carried per Klm ..	22.9	23.1	.2*	.86*
Average Receipt per Passenger ..	\$.1857	\$.1932	\$.0075*	3.88*
Average Receipt per Passenger per Klm ..	\$.0084	\$.0003	\$.0003	3.57*
<i>Freight:</i>				
Total Number Tonnes Carried ..	98,708	83,038	15,670	18.87
Number Tonnes Carried One Klm ..	3,535,821	2,448,301	1,087,520	44.42
Average Distance Carried per Klm ..	\$ 35.8	\$ 29.5	\$ 6.3	21.35
Average Receipt per Tonne ..	\$ 1.1438	\$ 1.0892	\$.0546	5.01
Average Receipt per Tonne per Klm ..	\$.0319	\$.0369	\$.005*	13.55*

REVENUE AND EXPENSES

	1914	1913	Increase or Decrease	Per Cent
<i>REVENUE</i>				
Passenger	\$ 220,711.84	\$ 204,755.88	\$ 15,955.96	7.79
Freight	112,899.88	90,441.83	22,458.05	24.83
Excess Baggage	959.28	830.12	129.16	15.55
Mail	5,439.24	5,413.55	25.69	.47
Express	5,578.94	4,250.12	1,310.82	30.98
Switching	4,848.87	5,110.50	270.63*	5.28*
Non-Transportation	10,780.95	9,767.72	1,013.23	10.37
Total Revenue	\$ 361,219.00	\$ 320,587.72	\$ 40,631.28	12.67
<i>EXPENSES</i>				
Maintenance of Way and Structure ..	\$ 51,150.57	\$ 84,677.60	\$ 33,527.03*	39.59*
Maintenance of Equipment	45,940.13	51,802.68	5,862.55*	11.31*
Traffic	8,301.84	14,064.26	5,762.42*	40.97*
Transportation	97,950.52	110,652.65	12,702.13*	11.48*
General	29,451.93	27,293.27	2,158.66	7.91
Total Expenses	\$ 232,794.99	\$ 288,490.46	\$ 55,695.47*	19.30*
Net Operating Revenue	\$ 128,424.01	\$ 32,097.26	\$ 96,326.75	300.11
Operating Ratio	64.41%	89.99%		
Miles Operated	131.65	131.65		
*Decrease.				

Auxiliary Operations—Revenues:

Commercial Shop Work ..	\$32,516.91
Boat Line	1,715.82

Total Revenue .. 34,232.73

Auxiliary Operations—Expenses:

Commercial Shop Work ..	\$27,030.96
Boat Line	6,712.55

Total Expenses .. \$33,743.51

Net Revenue—Auxiliary Operations .. 489.22

Net Operating Revenue .. \$128,913.23

Taxes .. 2,494.67

Operating Income .. \$126,418.56

Income from unfunded

Securities and Accounts ..	\$2,842.07
Miscellaneous Income ..	320.00

Total Other Income .. 3,162.07

Gross Income .. \$129,580.63

Deduction from Gross Income:

Interest on Funded Debt ..	\$342,040.00
Miscellaneous	798.22

Total Deductions .. 342,838.22

Net Loss .. \$213,257.59

Appropriation for Additions and Betterments:

Expended during the year .. 3,949.00

Income Balance Transferred to Debit of Profit and Loss .. \$217,206.68

THE RAILWAYS OF CHOSEN

The Annual Report of the Chosen (Korean) railways for the Fiscal Year 1912 has recently been presented to the Governor-General of Chosen by the Director of the Railway Bureau. Although it is late in appearing it is worthy of reproduction in part as showing the progress made by the Japanese in the development of the railway system of the country. It is as follows:—

The average working mileage for the year in passenger traffic was 802.9 miles and that in goods traffic 707.3 miles, showing increases of 93.9 miles in the former and 88.4 miles in the latter over the preceding year. The train mileage totalled 3,015,987 miles, the number of passengers carried, 4,399,022, and the tonnage of freight hauled, 1,105,362 tons, showing increases of 708,320 miles in train mileage, 1,069,335 in passengers and 42,251 tons in freight hauled, compared with the corresponding figures of the preceding year. The aggregate passenger and freight mileages were 165,034,551 and 100,282,500, respectively, being an increase of 60,038,511 in the former and of 9,854,175 in the latter over the preceding year.

The receipts for the year were Yen 3,545,225 from passengers and Yen 2,281,743 from freight, making a total of Yen 5,826,968 and showing an increase of Yen 904,414 over the preceding year.

The following are the general features to be noted in regard to the traffic during the year under review.

In passenger traffic, the revision in fare which resulted in a striking increase in the number of passengers, the greater transportation of troops, both relief and time-expired, caused by those destined for Manchuria, the great popularity of the excursion trains run to Sodo, Suigen and Kaijyo, the less damage done to tracks and consequently the less obstruction caused to traffic from annual floods during the rainy season, notwithstanding the heavy rains experienced, the fine weather in autumn which induced people to go on excursions and picnics, and the transportation of tourist parties and immigrants from Japan, all combined to bring about a result never before attained.

In goods traffic, though the revision in freight charges and reduction in the rate for grain destined to ports were the cause of great increase in the quantity of goods handled, the transportation of Manchurian millet, the demand for which by Koreans had arisen on account of the rise in market price of rice in Japan, the transportation of Heijyo and Fushun coal, and of refined salt from Jinsen, all increased greatly on account of enlarged demand, and the transportation of building materials, tobacco, dried salt fish, firewood and charcoal also increased to a certain extent compared with last year; but, on the other hand, the difficulty of living experienced by Koreans on account of the rise in the market price of rice made their demand for spun thread, calico, hemp cloth and furniture less, and in consequence the transportation of these goods showed a decrease when compared with that of last year.

The principal traffic arrangements made during the year were as follows: the revision in passenger fares on April 1, 1912, fixing them in proportion to the distance travelled instead of decreasing the mileage rate with increase in distance as heretofore practised, and making the 3rd class fare two Sen per mile with increases of 75 per cent, and 150 per cent, respectively for 2nd and 1st classes. The revision in freight charge was made on July 1, by adopting the regulation for classification of goods and greatly reducing the charge. The regulation for lowest possible rate was abolished and that of car consignment put in force at the same time. Besides this, the

section for decreasing the mileage rate with increase in distance was further extended, making the transportation of goods over a great distance cheaper than ever. To keep pace with the Shimonoseki-Shimbashi limited express, which is a new service, the Chosen-Manchuria through express was extended to Fusan for the convenience of passengers to and from Europe or China, and revision in train time on all lines too was made on June 15. The provision of 1st class berths on the Fusan-Antung express train was begun on August 15; the installations for electric lighting were made on the Kei-Fu and Kei-Gi through expresses and Kei-Jin trains and have been in use since November. The reduction in car consignment charge of grain destined to goods stations at Fusan, Soryo, Kunsan, Jinsen, Chinnampo and Shingishu was put in force on December 1 so as to encourage the transportation and exportation of grain. Return tickets at reduced rates were put on sale on every market day at neighbouring stations to afford facility to passengers going to market at Taikyu, Shari-in and Sensen, and their hand-luggage carried free of charge up to 100 *kin* from March 1. In joint traffic, the extension of the sections and certain other improvements in joint transportation on the lines of the Imperial Railways of Japan and the South Manchuria Railway Co. were made. For the facility of communication along the coast, a new joint traffic was opened with liners of the Chosen Yusen Kaisha (Chosen Mail S. S. Co.) on August 1. Among other things many important matters were put in force, such as the opening of traffic on the new lines, and other arrangements made to induce passengers and goods to avail themselves of the railway.

Station hotels were opened at Fusan and Shingishu by utilizing the upper floors of the stations, the former on July 15 and the latter on August 15. Though we have not yet attained fine results in this direction, we are sure that they are a great convenience to passengers.

The locomotive mileage during the year totalled 3,487,058 miles, and the converted carriage and wagon mileage 23,126,404 miles; coal consumed amounted to 194,624,228 *kin*, that is, 179,179,947 for running and 15,444,281 for lighting, etc; oil consumed reached 146,591 *sho*, that is, 79,125 for locomotive and 69,466 *sho* for carriages, wagons, etc. Compared with the corresponding figures of the preceding year, these show increases of 668,060 in locomotive mileage, 4,850,585 in carriage and wagon mileage, 42,983,867 *kin* in coal consumed for running and 3,801,517 in that for lighting, 13,929 *sho* in oil for locomotives and 13,588 in that for carriages, wagons, etc.

Rolling stock returns show 138 locomotives, 209 carriages, 1,445 wagons and two steamboats, being increases of 5 locomotives, 18 carriages and 110 wagons.

The principal items of equipment and improvement made to rolling stock, etc. were the addition of 5 locomotives, 12 carriages, and 116 wagons, and the erection of 314 spans of girders, besides the equipping of 14 locomotives with steam brakes and of 90 carriages with electric lamps, the alteration of couplers in 12 wagons, the new equipping of 51 wagons with automatic couplers and of 86 with air train pipes.

The aggregate length of electrical communication lines at the end of the year was 2,105 *ri*; telegraphic apparatus provided numbered 122, telephonic, 877 and blocks, 235. Railway telegraph stations numbered 129; railway messages dealt with were 3,597,264 and public messages, 348,502, being a total of 3,945,766. The revenue from public telegrams was Yen 11,259. Generating stations numbered two, with engines of 830 h. p. in total capacity

and 466 k. w. in that of generators. Electric lamps numbered 33 arc and 5,308 incandescent, 6 of the former and 1,179 of the latter being supplied under contract. Those installed in carriages numbered 1,265 in all.

Traffic mileage during the year totalled 837 miles and the aggregate mileage of tracks, 1,033 m. 27 ch., being increases of 69.4 miles in the former and 87 m. 55 ch. in the latter over the preceding year. The number of the stations was 131, being greater by 10 than in the preceding year.

As to maintenance, such works as repairs to tracks, renewal of sleepers, spreading of gravel, repainting of bridge girders, renewing of telegraph poles, repairs and alterations in station buildings and official residences, and other works necessitated by the condition of the tracks on every line, were done during the year.

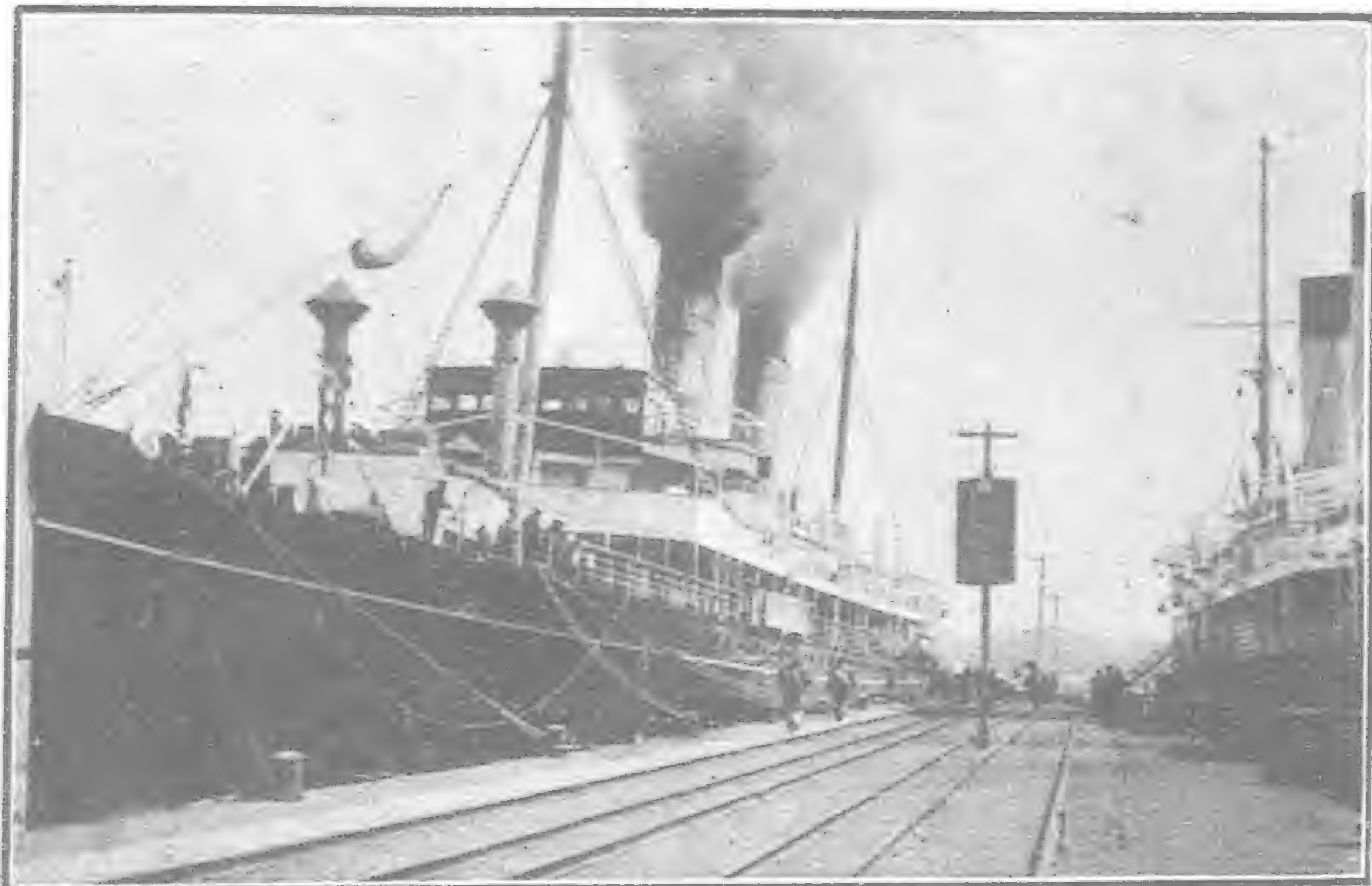
Of additional works done, completion of the remaining portion of the reconstruction of In-Yokusen section, and other arrangements and additions consequent upon that already done must be mentioned.

As to extraordinary repairs, restoration of tracks, embankments, cuttings and various buildings was effected, as the rain in July inflicted some damage on the various lines.

As to improvements, about two-tenths of the body and embankment works of bridge No. 2 over the Kanko was done, and improvement work on the foundations of piers Nos. 4, 5 and 9 of the bridge taken up. The construction of piers for the flood openings for the Seisen and Dainei, the raising of the formation level along the Koshu-Chinson section, and various other works were also done.

As regards the progress of construction the following may be mentioned: on the Kei-Fu line the construction of bridge No. 2 over the Kanko, the erection of dormitory and boarding house, and the installation of interlocking machines in Nandaimon Station compound, the addition of a roof over the platform leading to the Customs pier at Fusan Station, besides the building of some official houses and dormitories, were completed. On the Kei-Gi line, the installation of interlocking machines in Ryuzan Station compound, the construction of the machine shop and the head office building in the same compound, carried on from the previous year, the building of Mochuri Station, the reconstruction of the temporary bridges on the Hei-Nan line, as well as alterations in stations, and the addition of open culverts, etc. were all taken up. On the Kei-Gen line, the construction work made striking progress since October, 1910, when it was taken up and the Giseifu-Tetsugen section (41.4 m.) was opened to traffic during the year. The greater part of the earth and bridge work on the Tetsugen-Sempo section, and the earth, bridge and rail-laying work on the Gensan-Nanzan section were also completed during the year, while the remaining part of the work made progress as predetermined, and the construction of Official houses and dormitories, as well as of telegraph lines, was taken up. On the Konan line, the construction work has made great progress since October, 1910, when it was started, and the Riri-Seiyu section (27.2 m.) was finished and opened to traffic during the year. On the remaining part of the line, one-half of the tunnelling between Seiyu and Shigairi, eight-tenths of the work of the rest, and work on the Mokpo-Kakkyo section (22.3 m.) were completed, while the remaining part of the work also made the progress planned in earth, bridge and tunnel works, and the erection of official houses, dormitories and telegraph lines was also taken up.

Receipts relating to traffic in the year amounted to Yen 6,817,263 and expenditure to Yen 5,974,395, leaving a balance of Yen 852,868



FUSAN PIER WHERE CONNEXION IS MADE BY STEAMER FOR SHIMONOSEKI AND THE JAPANESE RAILWAYS



BRIDGE ACROSS THE YALU RIVER WHERE CONNEXION IS MADE WITH THE ANTUNG-MUKDEN LINE



VIEW OF SEOUL (KEIJO) FROM NEAR ADMINISTRATION OFFICES OF THE GOVERNMENT



OFFICES OF ORIENTAL DEVELOPMENT COMPANY—SEOUL HAS MANY SUCH HANDSOME BUILDINGS



PAVILIONS ATTACHED TO THE SHOKOTU PALACE—ONE OF MANY POINTS OF INTEREST



KOREAN COOLIES WITH TRIPOD CARRYING DEVICE WHICH ENABLES THEM TO REST UNDER THEIR LOADS

as profit. Compared with figures of the preceding year, the increase in receipts was yen 1,059,145, that in expenditure Yen 840,228, and that in profit Yen 218,917.

In the Railway Store Account, the earnings amounted to Yen 5,308,308 and the disbursements to Yen 5,307,143, leaving a balance of Yen 1,165.

The value of contracts in the purchase of railway stores amounted to Yen 4,662,731, being a decrease of Yen 742,278, as compared with the previous year.

The capital invested in the railways since the commencement of their construction up to the end of the previous year totalled Yen 105,076,992. Adding to this the sum of Yen 9,643,424, the increase made during the year, the total capital invested up to the end of the year under review reaches Yen 114,720,386.

The members of the Relief Association numbered 4,393 at the end of last year; adding 1,376 newly admitted and deducting 1,057 withdrawn during the year, the number at the end of the year was 4,712. The receipts totalled Yen 74,237; of this amount Yen 26,083 was the grant made by the Government, Yen 42,359 represented subscriptions from members, and Yen 4,795, interest on deposits. The disbursements totalled Yen 28,528; of this amount Yen 7,265 was the grant made in regard to injuries, Yen 10,864, for deaths, Yen 4,333 for medical allowance, and Yen 6,066, the amount refunded to members resigning. The number of persons to whom grants were made reached 1,188. A sum of yen 133,867, made up of yen 45,700, the balance at the end of the year, and yen 88,158 transferred from the previous year's account, was carried forward to the account for the year following.

Light railways and tramways in Chosen in operation at the end of the year were six, namely, the systems operated by the Nikkan Gas Electric Co. and two other companies, and three operated as private concerns. The aggregate capital of these light railways and tramways totalled yen 9,876,600, of which amount yen 4,819,149 was paid up, while the amount invested in them reached yen 2,169,855. The mileage open to traffic totalled 22.3 miles, consisting of 14.6 m. of electric tramway in Keijyo, 5.8 m. of light railway between Fusan-chin and Torai in Keishonando, 1.2 m. of manual tramway in Heijyo and 0.7 m. of manual tramway for goods between Wakan railway station and Rakutoko. The mileage to be opened hereafter amounts to 150.3 miles, namely, 7 m. of electric tramway in Fusan-fu, 115.2 m. of light railway between Torai and Keishu, Keishu and Hoko, and Urusan and Choseiho, 16 m. of light railway between Riri and Zenshu in Zenrahokudo and 12.1 m. of the same between Seishin and Ranan in Zenshu Kankyohokudo.

RESULTS OF TRAFFIC.

The average working mileages were 802.9 m. in passenger traffic and 797.3 m. in goods traffic. Train mileage amounted to 3,015,987 miles, that of carriages to 9,449,727 miles, and that of wagons to 15,246,710 miles. The number of passengers carried amounted to 4,399,022, while the passenger mileage reached 165,034,551 miles. The tonnage of goods amounted to 1,105,362 tons, while the ton mileage reached 100,282,500 miles. Receipts from passengers amounted to Yen 3,545,225 and that from goods, to Yen 2,281,743, making a total of Yen 5,826,968.

The above results obtained during the year show increases of 93.9 miles in passenger traffic mileage in consequence of extension of the Kei-Gen and Konan lines and reconstruction of sections along the Kei-Gi line, 88.4 miles in goods traffic mileage, 30.7 per cent. in train mileage, 41.6 per cent. in car mileage, 14.7 per cent. in wagon mileage, 81.1 per cent. in number of passengers carried, 57.2 per cent. in passenger mileage, 4.0 per cent. in tonnage of goods, 10.9 per cent. in ton mileage, and 18.4 per cent. in total traffic receipts, being increases of 30.6 per cent. from passengers and 3.2 per cent. from goods, as compared with the figures for the preceding year.

These fine results, which we have not hitherto obtained, are mostly due to the decrease in passenger and goods fares, the natural increase in passengers and goods consequent upon various developments in Chosen, the closer relation between Chosen and Manchuria in consequence of the completion of the bridge over the Yalu, and the various other improvements in traffic arrangements.

In passenger traffic, the great reduction made in the fare by fixing it in proportion to the distance, instead of decreasing mileage rate with increase in distance as heretofore practised, induced natives of the lower class to go by train instead of on foot as was formerly their custom, and greatly increased the number of short distance passengers; the great transportation of troops, both relief and time-expired, and that of tourist parties, as well as the considerable number of visitors carried by train to view the cherry blossoms at Gyuji-do on the Kei-Gen line, the plum blossoms at Kaijyo, and on excursions to Suigen, are also worth mentioning, as they greatly assisted in bringing about the fine results attained in our traffic. Again, though we experienced more or less depression in traffic on account of rains during the summer, it was not so great as it might have been as a large number of school boys going for their holidays, soldiers, and military officials travelled over the lines. The sale of return tickets at reduced rates to people going to the open air bathing place at Jinsen under the auspices of the "Keijyo Nippo" (newspaper), and the annual meeting of the Presbyterian Churches held at Heijyo in late summer also helped very much to make our traffic prosperous.

We may say that autumn is the most enjoyable season of the year in Chosen, and we had especially fine weather during last autumn, which naturally induced many tourist parties to move; the migration of Koreans to Manchuria likewise added greatly to the number of passengers carried. Though we always experience a decrease in passengers during the winter on account of the severe cold, we transported a portion of the army stationed in Chosen as relief, and in March, with the advent of warmer weather, we had a conspicuous increase in passengers together with transportation of relief and time-expired soldiers, as well as greater numbers of emigrants, parties of whom had been constantly leaving Chosen since the previous autumn, to the region along the upper course of the Yalu. The sale of return tickets to people going to market, in force since March 1, was another factor contributing to our success; besides, we cannot ignore the increase of Japanese entering Chosen during the year.

Thus the results of passenger traffic during the year were excellent, showing 563 passengers per day per mile and Yen 12.10 in receipts, being increases of 158 in passengers and Yen 1.64 in receipts, as compared with the previous year. The reduction in passenger fare resulted in the decrease of Yen 0.42, showing sen 1.97 in average fare per passenger per mile. The average mileage per passenger showed 37.5 miles and the fare per passenger Yen 0.74, being decreases of 5.7 miles in mileage and Yen 0.29 in fare as compared with the corresponding figures of the preceding year; all this is doubtless the result of increase in short-distance passengers.

The goods traffic does not show up so well in results as the passenger traffic, merely on account of a conspicuous decrease in the transportation of railway articles; in that of public goods we did quite as much as in other years. On the other hand the revision in the goods

tariff in July, together with that in the passenger tariff, was put into force to encourage the development of general industry in Chosen, though with the expectation of a decrease in receipts from goods, but the result was quite otherwise, and the increase in goods for transportation not only offset the anticipated decrease in receipts but even showed some increase in it. A classification system was inserted in the revised goods tariff regulations, and not only was the reduction in freight charge and terminal fee made, but the section for decreasing the rate according to the distance was expanded, all of which caused increase in the goods for transportation. Our earnest endeavour to induce transportation of goods by rail gradually began to bring forth fruit at the same time. Moreover the joint transportations with other lines and the steamship line became more promising as we made an extension in the section for the former and a new agreement was made with the latter.

With reference to the transportation of important goods, we may say that the rise in price, in Japan, as well as the favourable arrangement for a special reduction in freight charge for goods arriving at Fusan, Soryo, Kunsan, Jinsen, Chinnampo, and Shingishu from stations over 195 miles distant from these ports, greatly increased the quantity of goods destined for Japan; besides, the demand for Manchurian millet by the Korean people gradually increased on account of the higher price of rice in Japan, and the importation of the above from Manchuria was unceasing; these causes greatly helped to bring about the result of 178,000 tons in grain carried over the lines, some 30,000 tons more than in the previous year.

The transportation of coal over our line greatly increased, too, and reached about 167,000 tons as the consequence of a development in the business of the Heijyo Mining Office (about 70 per cent. of the amount being consigned from Heijyo) and the incoming of Fushun coal into Chosen. In regard to salt, the demand for refined salt from Jinsen became much wider, extending to Nansen in the north and to Mitsuyo in the south, and reached about 17,000 tons in the total transported; besides, the transportation of salt from Fusan, Shuan, Kokei, Heitaku and Kiho was very brisk and reached about 30,000 tons. As regards building materials, their transportation increased greatly, reaching about 66,000 tons in lumber, about 13,000 tons in bricks, tiles and earthen pipes, and about 6,000 tons in lime and cement. Besides, the transportation of other articles such as tobacco, salted dried fish, firewood, charcoal, vegetables, and sugar was more than in the previous year. As the rise in the market price of rice had brought about a difficulty in living among the Koreans and consequently diminished their purchasing ability, it resulted in the fall of demand for spun thread (cotton), linen, hemp, cloth, furniture, etc.

In the conditions above mentioned, the average tonnage per mile per day was 345 tons and their receipts, Yen 7.84, being a decrease of 4 tons in tonnage and of Yen 0.67 in receipts compared with the preceding year. As the result of reduction in goods tariff, the average rate per mile per ton was sen 2.08, being a decrease of sen .06 on that of the preceding year. In long-distance transportation, the average mile per ton showed 90.7 miles and the receipts Yen 1.88, being increases of 5.6 miles and sen 6 respectively over the preceding year.

The results of the passenger and goods traffic according to the different lines are as follow:—

Line	Passengers				Goods			
	Av. Traffic	No. of	Coaching	Av.	Av. Traffic	Tonnage	Goods	Av.
	Mileage	Passengers	Receipts	Day-Mile	Mileage	of Goods	Receipts	Day-Mile
	Miles		Yen	Yen	Miles	Tons	Yen	Yen
Kei-Fu.....	318.1	2,734,991	2,082,752	17.94	318.1	619,403	1,231,749	10.61
Kei-Gi.....	360.8	1,432,193	1,190,650	9.04	355.2	460,488	919,854	7.19
Kei-Gen.....	44.2	190,169	90,380	5.61	44.2	79,127	56,128	3.48
Konan.....	79.8	381,826	181,443	6.23	79.8	127,790	74,012	2.54



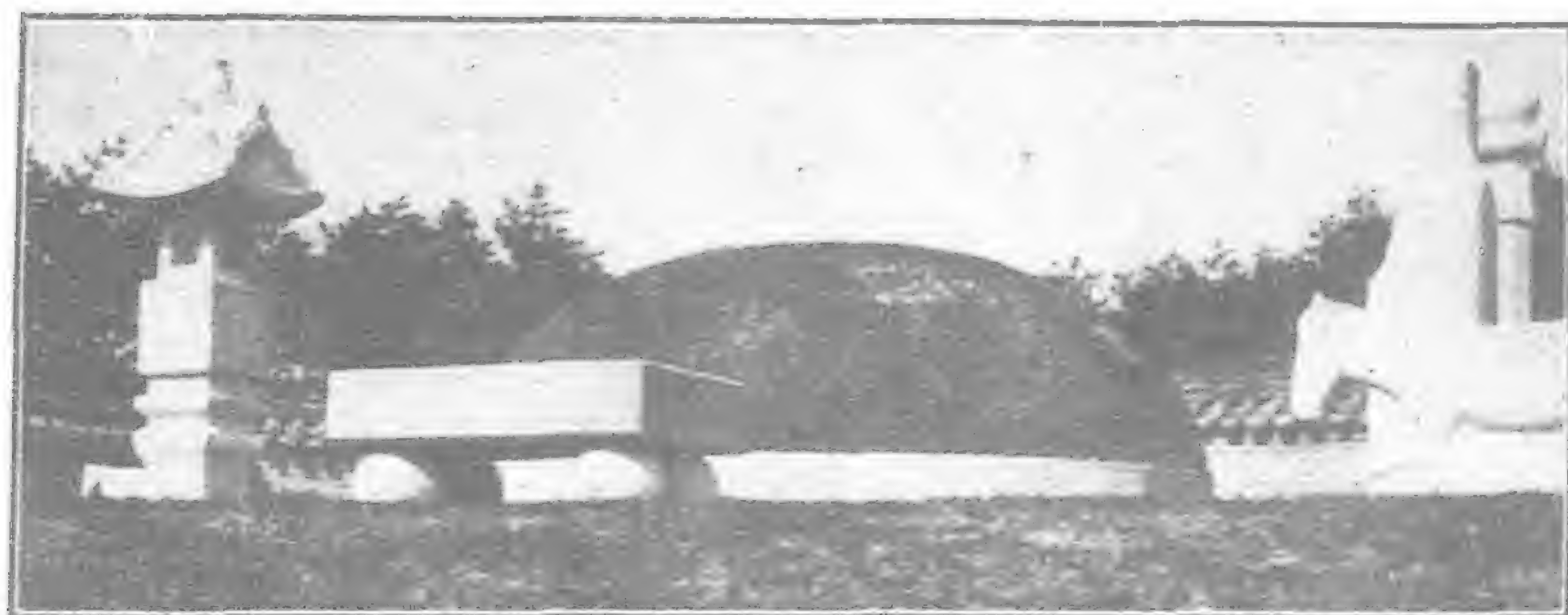
BUREAU OF COMMUNICATIONS OF THE KOREAN GOVERNMENT



NANDAIMON--THE GREAT SOUTH GATE--SEOUL



SCHOOL ATTACHED TO KOREAN AGRICULTURAL STATION



TOMB OF LATE QUEEN OF KOREA--SEOUL



KOREAN WEAVERS AND SPINNERS



KOREAN PILGRIM AT WAYSIDE PAGAN SHRINE

RESULTS OF LOCOMOTIVE WORKING.

The mileage of locomotives on all the lines during the year was 3,487,057.7 miles and the converted mileage of cars was 23,126,403.8 miles, while the coal consumed for running amounted

to 179,179,947 *kin* and the oil to 73,703.55 *sho* (excluding that for air pumps and lamps).

The following are the results of locomotive working on the different lines, details of which are given in the tables annexed.

LINE	Locomotive Mileage <i>Miles</i>	Converted Car Mileage <i>Miles</i>	Coal consumed for Running <i>kin</i>	Oil consumed for Running <i>sho</i>
Kei-Fu.....	1,864,562.1	12,261,462.6	99,144,237	41,434.35
Kei-Gi	1,353,442.4	9,730,562.4	68,714,300	27,138.40
Kei-Gen	75,882.2	387,337.7	3,559,210	1,344.25
Konan	193,171.0	747,041.1	7,762,200	3,786.55

INCREASE AND IMPROVEMENTS IN ROLLING STOCK.

The following increase was made in rolling stock during the year under review:

Description	Number	Manufacturers	Remarks
Locomotives 6 wheels coupled, double ender tank	5	Borsig Works, Germany	Arrived during last year.
Carriage 3rd class	12	Ryuzan Works	
Wagons Covered	65	ditto	
Wagons Open, with 2 side boards	8	ditto	With hand brake
Wagons Open	43	Soryo Works	10 of the number with brake

N.B.—Six 1st & 2nd class composite cars, and twelve 10 wheeled tender engines from America, are now in course of erection at our Ryuzan Works and are expected to be finished during the year following.

Rolling Stock and Steamboats

Rolling stock and steamboats at the end of the year included 138 locomotives, 209 carriages, 1,445 wagons, and 2 steamboats, being increases of 5 locomotives, 18 carriages, and 110 wagons over the preceding year.

Locomotives at End of Year.

ENGINES	ITEM	Number	Tonnage	Increase or Dec. against preceding Year
Tank Engines	6 wheel coupled (8 wheels)...	4	133.80	—
	6 wheel coupled (10 wheels)...	84	4,200.00	5
Total		88	4,333.80	5
Tender Engines	4 wheel coupled (4 wheels)...	2	87.58	—
	4 wheel coupled (8 wheels)...	6	516.00	—
	6 wheel coupled (10 wheels)...	30	3,053.40	—
	6 wheel coupled, compound cylinder (10 wheels).....	6	648.12	—
	8 wheel coupled (10 wheels)...	6	600.00	—
Total		50	4,905.10	—
Grand Total		138	9,238.90	5

N.B.—Ratio per 100 open miles is 10.51 of tank engines and 5.97 of tender engines, and 16.40 in the total.

Carriages at End of Year.

ITEM		No.	Seats					Inc. or Dec. against preceding Year		Ratio per 100 open Mileage	
KIND			Din. Room & Berths	1st class	2nd class	3rd class	Capacity Total	Num- ber	Pas- sengers	Num- ber	States
4 wheeled bogies											
Special Car.....	1	—	—	27	—	—	27	—	—	.12	3.23
Private Car.....	3	—	—	74	—	—	74	—	—	.36	8.84
1st Class with Sleep- ing Berths	4	B.	48	124	—	—	172	—	44	.48	20.55
1st Class with Dining Room.....	4	D.	48	96	—	—	184	—	—	.48	21.98
1st and 2nd Class Composite.....	9	—	—	252	330	—	582	—	—	1.08	69.53
1st and 2nd Class with Kitchen.....	2	—	—	48	68	—	116	2	116	.24	13.86
2nd Class Cars.....	4	—	—	—	312	—	312	—	—	.48	37.28
2nd Class Cars with Kitchen.....	4	D.	88	—	88	—	176	4	176	.48	21.03
2nd & 3rd Class Com- posite	31	—	—	—	802	1,906	2,708	2	208	3.70	323.54
3rd Class Cars.....	78	—	—	—	—	7,518	7,518	8	832	9.32	898.21
3rd Class Cars (small type).....	6	—	—	—	—	408	408	—	—	.72	48.75
3rd Class Cars with Kitchen.....	8	—	—	—	—	568	568	—	—	.96	67.86
3rd Class and Mail Composite.....	4	—	—	—	—	102	192	6,272	—	.48	22.94
3rd Class Mail and Brake Composite...	3	—	—	—	—	72	72	6,711	—	.36	8.60
Mail and Brake Com- posite.....	10	—	—	—	—	—	14,000	6	—	1.19	—
Mail, Luggage and Brake Composite...	10	—	—	—	—	—	29,638	—	—	1.19	—
Luggage and Brake Composite.....	26	—	—	—	—	—	64,072	—	—	3.11	—
Carriage for Official Use	2	—	—	—	58	—	58	—	—	.24	6.93
Total	209	R. D.	49 176	621	58 1,600	10,664	13,167	121,503	18 1,056	24.97	1,573.12

Workshops

Workshops in the year numbered three, namely, Soryo, Ryuzan, and Heijyo workshops; the average number of artisans and workmen employed per day was 1,463.39, the aggregate of the daily numbers reaching 463,879.34 and the wages totalled Yen 345,173.42.

Principal items of building and repair were the building of twelve 3rd class passenger cars, sixty-five covered wagons, and fifty-one open wagons, and the repairing of 165 locomotives (33 being trivial repairs only), 369 carriages, and 1,045 wagons. In erection work, five locomotives newly bought and 314 spans of girders may be mentioned. Conversions made were four 1st and 2nd class composite carriages with berths into 1st class carriages with berths, two 1st and 2nd class composite cars with kitchen and two 2nd and 3rd class composite cars into 2nd class cars with dining room, four 3rd class cars into 2nd and 3rd class composite cars, and six covered wagons into mail and brake vans. New equipments made were those of steam brakes to 14 locomotives, electric lights to 90 carriages, three water-closets to three carriages, guard-boxes to eight open wagons, and steam train pipes to 12 coal cars and 74 open wagons. Replacing of couplers in 63 wagons may also be mentioned.

In addition, windows were inserted in covered wagons for use in transportation of soldiers; 5 locomotives, 6 carriages, and 68 wagons were taken to pieces and packed for conveyance to Mokpo and Gensan, some of which were again set up in those towns during the year.

Details of building and repairs are given in the table annexed.

New arrangements at Soryo Workshop were the construction of a new line for shop use in the compound, a new equipment of electric lights (not under our own management), and a new workshop for examination and repair of electric lights in carriages. The horse power in use at the end of the year was supplied by four engines aggregating 170 h. p.

At Ryuzan Workshop, the building of the machine and erecting shops was finished and 41 sets of machines were removed from the temporary shops and set up in the new shops. The manufacture and fixing of twenty-eight spans of 20 ft. girders for overhead cranes were also completed, and are ready for work as soon as the cranes are purchased. Besides, a set of steam hammers in the smith's shop, a set each of electric fans and jib-cranes in the machine shop, and a dry kiln in the carpenter's shop were installed. The fixing-up of a goliath crane in the erecting shop and two sets of air compressors newly bought in the boiler shop is now under way. The motive power in use at the end of the year was supplied by two dynamos of 225 k. w. (one kept for emergencies), sixteen sets of motors of 6.49 h. p. in all, and two sets of air compressors of 90 h. p.

Construction and Improvement

Kei-Fu Line.—The construction of bridge No. 2 over the R. Kan and the building of a dormitory and boarding house in Nandaimon Station compound, continued from the previous year, were finished; the planking of bridge No. 1 over the Kan, the construction of line No. 2 between Roryoshin and Ryuzan, and the installation of the interlocking arrangement at Nandaimon Station compound were also done during the year. The construction of a new shunting line at Nandaimon Station is now under way. Roofs over the platform from the main building to the pier at Fusan, as well as official houses and the dormitory there, were likewise completed.

As regards improvement work, repairs done to the retaining stone walls along the line in the Sanroshin-Mitsuyo section and to those in the cutting along the Seido-Keizan section, and the construction of retaining stone walls for the line along the Shogen-Shinei section were all finished; about two-tenths of the body work of bridge No. 2 over the Kan as well as the embankments at the two ends were done, besides the taking up of the improvement work



LION PEAK OF DIAMOND MOUNTAINS.



ANCIENT PAVILIONS ON RIVER DAIDO.

Wagons at End of Year.

ITEM	Capacity				Total		Inc. or Dec. against preceding Year		Ratio per 100 Traffic Mileage	
	10 ton	14 ton	22 ton	26 ton	No.	Tons	No.	Tons	No.	Tons
KIND										
Covered Wagons										
Wagons	—	—	20	71	91	2,286	—	8	10.87	—
Ditto with Air Brake...	—	—	—	205	205	7,670	65	1,690	35.24	—
Ditto with Hand Brake	—	—	8	10	18	436	6	104	2.15	—
Goods Brake Vans.....	—	—	12	24	36	888	—	16	4.30	—
Cattle Trucks.....	—	—	24	—	24	528	—	48	2.87	—
Total	—	—	64	400	464	11,868	59	1,658	55.44	1,410.75
Open Wagons										
Wagons.....	—	—	270	272	542	13,012	51	1,326	64.76	—
Coal Truck.....	—	—	15	78	93	2,358	—	—	11.11	—
Small Type Trucks for Construction Use	342	—	—	—	342	3,420	—	—	40.86	—
Total	342	—	285	350	977	18,790	51	1,326	116.73	2,244.92
Water Tank Cars	—	4	—	—	4	56	—	—	.48	6.69
Grand Total.....	342	4	349	750	1,445	30,654	110	2,984	172.64	3,662.37

on foundations for piers Nos. 4, 5 and 9 of the same bridge.

Kei-Gi Line.—The construction of the erecting and machine shops and the Bureau offices in Ryuzan Station compound, as well as the extension of sidings at every station on the line and other new arrangements at different

stations, which have been continuously going on since last year, were finished; the installation of interlocking arrangements in Ryuzan Station compound was also completed. The building of a temporary station at Mochuri, alterations to Hakuba Station, removal of the auxiliary building of the Railway School, and

the renewal of official houses at Kosui and Seikei Stations are now in hand.

The rebuilding of temporary bridges over the Togun, Indo, Sei, Mokpo, Taiho, Nikkachi, and of No. 2 bridge over the Shadoho, and the enlarging of open culverts along the Heijyo-Chinnampo branch line, all of which have been in the course of construction since last year, were all finished. Enlarging work at every station, as well as the Wharf at Chinnampo, is now being done.

In improvement work, the construction of flood openings for the Seisen and Dainei Rivers in the Shinanshu-Reibi section, rebuilding of the bridges over the Genren and Eitaku, that of the bridge over the Ryusanri in the Junan-Gyoha section, the raising of the formation level at the approach to Ryusanri bridge as well as in the Chinson-Koshu section, the foot protection work of the piers of Shankyosen bridge in Hiken-Hakuba section, repairs to the cuttings along the Dojyo-Keisei section and the construction of side drains along the Seihō-Junan section besides some arrangements in Ryuzan Station compound and other minor works were all done.

Kei-Gen Line.—This being a new line of 138.4 miles between Ryuzan and Genzan, the whole route was decided upon during the year. The construction work has made conspicuous progress since its commencement in October, 1910, and the Ryuzan-Tetsugen section of 60.3 miles in length is already open to traffic. As to the remaining part, earth and bridge works



MARKET DAY AT TAIKYU.



BUDDHIST TEMPLE IN YUTENGI, DIAMOND MOUNTAIN.



ANCIENT PAVILIONS AT SUIGEN.



BIRDSEYE VIEW OF SEOUL.

of the Tetsugen-Sempo section from the Ryuzan end were nearly finished, and earth work, bridges and laying of rails were completely finished throughout the Genzan-Nanzan section (13.6 m.) from the Genzan end, while work on other sections is now going on. Following are general remarks on the route selected and the construction of the line.

Routes: The Sempo-Kozan section starts at a point about a mile southwest from Dojodo in Heiko-gun, Kogen-do (92.8 from Ryuzan), runs northeast across the plateau of Dojo, meets the upper course of the R. Sanbo, runs along the river down to Kokushido, enters Ampen-gun in Kankyonando, passes through Sanbo, Shosuido, Chukatai and Saisen, then enters Shinten, turns to the left away from the river and reaches a point about 3 miles southwest from Kozan (109.7 m. from Ryuzan). This section has 14 tunnels (11,149 ft. in all), and 19 bridges (4,217 ft. in total length) over the Sanbo, while its highest gradient is 1 in 40 and the sharpest curve, 15 chains in radius.

Construction: Though 19.8 m. of the Ryuzan-Giseifu section had been finished and opened to traffic during the previous year, the raising of the formation level of a portion 9 miles from Ryuzan is now in hand to guard the track against recurrence of floods, and a goods platform was built on the bank of the Kan at a point 2 m. 47 ch. from Ryuzan.

As for 26.4 miles of the Giseifu-Rensen section, earth and bridge works had been finished during the previous year with the exception of the bridge over the Kannanko. The last piece of bridge work was done and the rails laid in the early part of the year; then the stations, official houses, etc., were built and the section was opened to traffic in July, 1912.

Of the Rensen-Heiko section which was in the course of construction during the previous year, 28.8 m. was opened to traffic in October on the completion of earth and bridge work, the laying of rails, and the building of stations and official houses.

The work on the Heiko-Sempo section of 17.8 m. was taken up in May, 1912; the excavation of headings of Kenfutsuro tunnel No. 1 (759 ft.) was finished in September, while the arch and side walls are now in the course of construction; the excavation of the headings of Kenfutsuro tunnel No. 2 (2,112 ft.) reached 2,023 ft. and about seven-tenths of the earth work and nine-tenths of the bridge work were done during the year.

The Sempo-Nanzan section (32 m.) runs along steep mountain sides and consequently has 14 tunnels (aggregating 11,149 ft.) and 35 bridges (5,618 ft. in all) and is considered to be the most difficult section on the Kei-Gen line in construction work. The work began in April, 1912, and about five-tenths of the earth work and about four-tenths of the bridge work were finished by the end of the year; as for the tunnels, with the exception of one, all the headings were excavated.

Work on the Nanzan-Genzan section continued from the previous year was completed during the year under review.

Laying of rails and running of construction trains: Following the progress of earth works and others, the rails were laid for 86 m. 74 ch. (to Kenfutsuro) on the Ryuzan side and for 13 m. (to Nanzan) on the Genzan side.

Building works: Along the Giseifu-Rensen section the main buildings for the stations at Tokutei, Todosen, Zenkoku and Rensen, which have been in the course of construction since last year, were finished. Official houses and a dormitory at Rensen, official houses at Todosen, and a dormitory at Tokutei were built. Along the Rensen-Heiko section the dormitories at Gesseiri and Heiko were finished, while the main buildings at Daikori and Tetsugen, and a dormitory at Tetsugen were finished, too. The erection of main buildings and official houses at Heiko and Gesseiri as well as official houses at Daikori was taken up. On the Heiko-Sempo section, official houses and a dormitory at Fukkei were built, while the erection of more official houses, a dormitory and a temporary locomotive shed was taken in hand.

As regards electric lines, one telegraph line along the Tetsugen-Heiko section, two along the Heiko-Sempo section and one along the Sempo-Nanzan section were constructed and the through communication between Ryuzan and Genzan has been effective since October, 1912. Besides, one block line on the Giseifu-Tetsugen section, two signal repeater lines in Rensen Station compound, two telephone lines along the Heiko-Sempo section, one telegraph line along the Giseifu-Tetsugen section, three telephone lines along the Sempo-Nanzan section, and one telephone line along the Nanzan-Genzan section were constructed.

Konan Line.—This is a new line (161.3 m.) running to Mokpo from Taiden with a branch to Kunsan (14.8 m.). The work has made conspicuous progress since its commencement in October, 1910, and the Taiden-Seiyu section (81.9 m.) and the Riri-Kunsan section (14.8 m.) are already completed and open to traffic. Five-tenths of the tunnel work on the Seiyu-Shigairi section and eight-tenths of other works from the Taiden end, and the Mokpo-Kakkyo section (22.3 m.) from the Mokpo end have been completed, while the remaining work is in progress. The improvement work on 2.3 miles of the track, near Kasuiri River Bridge No. 2, of the Kasuiri-Tokai section was taken up in October, being found necessary after our experience of the two preceding years. The following are some details of the work.

Regarding the Riri-Kintei section (11.5 m.) the construction of which has been in progress since last year, the earth and bridge works were finished in May, the laying of rails and building of various structures in October, and the section was then opened to traffic.

The Kintei-Seiyu section (15.7 m.) which was taken up at the end of the last fiscal year was opened to traffic in December, after the completion of earth and bridge works in September and of various other works later on.

Work on the Seiyu-Shigairi section was taken up in December, 1911, and the headings of Rorei tunnel No. 1 (1,056 ft.) were excavated in July and the arch and side walls were



RAILWAY STATION AT RYUZAN.



CHOSEN HOTEL AT SEOUL.

completed, 2,855 ft. of Rorei tunnel No. 2 (3,102 ft.) was excavated and work on the arch and side walls taken up; about eight-tenths each of the earth work were finished during the year under review.

Work on the Shigairi-Rinkoku section (15.7 m.) was taken up in November, 1912, and though about four-tenths of the earth work was done, no other work worth mentioning was done during the year.

Work on the Rinkoku-Rashu section (16.9 m.) was taken up in October, 1912, and about seven-tenths of the earth work and four-tenths of the bridge work were done during the year.

Work on the Rashu-Kakkyo section (13.1 m.) was taken up in the beginning of this fiscal year, and about nine-tenths of the earth work and Kyushimpo tunnel (432.2 ft.) and the whole of the bridge work were done during the year.

Work on the Kakkyo-Mokpo section (22.3 m.) continued from the previous year was finished in February, 1913.

Accompanying the completion of earth and other works, the rails were laid, their length reaching 6 m. 40 ch. from Seiyu on the Taiden side and 28 m. 40 ch. from Mokpo.

The buildings, stores and official houses at Gunreiri and Furanri continued from the previous year were completed; various buildings necessary for traffic as well as official houses and dormitories on the Taiden-Seiyu and Riri-Kunsan sections were built, and in addition, the roofing of the platform and the transferring of the dormitory at Taiden Station compound, the building of official houses and a doctor's office at Riri, and the building of official houses at Shigairi were taken up during the year. On the Mokpo side, the addition of official houses and a dormitory at Mokpo, a dormitory at Kobakuin, temporary official houses and dormitory at Kyushimpo, official houses, etc., at Shoteiri and a temporary dormitory at Chojo were finished, while the main buildings, goods platform roofs at Mokpo, Kakkyo and Rashu, locomotive shed and official houses at Mokpo, and official houses at Sankyo, Kakkyo and Rashu were taken up.

As regards electric lines, a block line along the Taiden-Shigairi and Riri-Kunsan sections, two telephone lines along the Rashu-Shigairi section and one more telegraph line along the Taiden-Mokpo section were constructed and communication opened the same year.

Accounts

Estimates and Settled Accounts Relating to Traffic and Profit and Loss Account.—The estimates of receipts and expenditure for the year relating to traffic amounted to Yen 7,334,904 and Yen 6,221,736 respectively, giving a balance of Yen 1,113,168 as profit, while the settled accounts of receipts and expenditure amounted to Yen 6,817,263.145 and Yen 5,964,395.380, giving a balance of Yen 852,867.765 as profit, which when compared with the estimated balance shows a decrease of Yen 260,300.235. Details of receipts and expenditure are shown in the table annexed.

Expenses for Construction, Improvement and Extraordinary Repairs.—The estimate for construction and improvement expenses for the year amounted to Yen 9,063,829.184, consisting of Yen 9,000,000, the fixed yearly amount, and Yen 63,829.184 brought forward from the previous year, while the settled account reached Yen 8,767,647.431, leaving a surplus of Yen 296,181.753 to be carried forward to the next year.

The expenses for extraordinary repairs amounted to Yen 617,089.256, consisting of Yen 592,302 of unestimated disbursement and Yen 24,697.256 brought forward from the previous year's account, while the settled account was Yen 612,882.511, leaving a balance of Yen 4,206.745 to be carried forward to the next year. Details of these two accounts are given in the table annexed.

Total Amount for Construction and Improvement and Yearly Disbursements.—The amount allotted for construction and improvement, previous to the fiscal year 1912, totalled

Yen 63,696,058; the sum of Yen 1,907,334 allotted for that year makes the grand total of Yen 65,603,392. Details and yearly sum are shown in the table annexed.

Capital Invested.—The sum defrayed from the Government-General account of construction, improvement and extraordinary repairs during the year amounted to Yen 9,380,522.942; adding to it, Yen 105,076,961.664, the capital invested up to the end of last year, and Yen 262,894.544 defrayed for additional works from operating expenses, the total sum invested at the end of the year is Yen 114,720,386.15. Details are given in the table annexed.

Estimates and Settled Account relating to Receipts and Expenditure of Railway Stores Fund.—The estimates of the receipts and expenditure for the year were Yen 5,583.352 each, against which the actual accounts amounted to Yen 4,106,020.18 in receipts and Yen 4,414,380.59 in expenditure, leaving balances of Yen 1,477,331.82 in the former and Yen 1,168,962.41 in the latter, both showing a decrease. The details are shown in the table annexed.

Assets and Liabilities Relating to Railway Stores Fund:

Profit and Loss Account.	
Assets	
Item	Amount Yen
Cash	11,850,571
Stores	698,492,677
Workshop Account	247,925,022
Total	958,248,270

Liabilities	
Item	Amount Yen
Capital	700,000,000
Receipts in Advance	257,102,590
Profits	1,165,680
Total	958,268,270

Profit and Loss.	
Loss	
Item	Amount Yen
Railway Stores Expenses	4,414,380.590
Value of Stores transferred from previous year	635,650,539
Advanced Receipts carried forward	257,102,590
Balance transferred to Government-General Account	1,165,680
Total	5,308,308,399

Profit	
Item	Amount Yen
Receipts from Railway Stores	4,106,020.180
Value of Stores carried-forward	946,417,699
Receipts in Advance from previous year	255,870,520
Total	5,308,308,399

Purchase of Railway Stores.—The purchases made during the year amounted in all to Yen 4,462,730.82, showing a decrease of Yen 742,278.18 as against the preceding year. Purchases made by free contract amounted to Yen 3,967,264.38 and those of small amounts to Yen 495,466.44. The following are the quantities and cost of principal articles.

Rails and Accessories, miles 80, cost Yen 736,132.560; Sleepers (including long ones), 624,371, Yen 723,731.066; Coal, tons 105,123, Yen 602,457.450; Cement, barrels 186,400, Yen 512,257.500; Locomotives, 13, Yen 374,040.000; Timbers, lots 100, Yen 305,973.932; Metals, tons 2,197, Yen 165,991.350; Bricks, 6,806,000, Yen 114,628.000; Oils and Grease, sho 408,706, Yen 100,288.255; Wheels and Axles, lots 14, Yen 90,558.600; Electrical Articles, lots 276, Yen 86,029.753; Steel Girders, spans 28, Yen 51,412.000; Paint, etc., lots 45, Yen 23,877.213; Others, Yen 565,453.141; Total Yen 4,462,730.820.

Light Railways and Tramways

Sanction for construction of light railways and tramways was given, in the year under review, for light railways between Torai and Taikyū, Keishū and Hoko, and Uruzan and

Choseiho, amounting to 115.2 miles, to the Chosen Gas Electric Co., for private light railways (for transportation of coal), between Seimenshinri and Manjyo, and Seimenshinri and Kisanri, in Heiannando, amounting to 9.1 miles, to K. Matsui, and for a light railway of 16 miles between Riri and Zenshu in Zenrahokudo to N. Koda and 28 other persons (Capital, Yen 350,000), making a total of 140.3 miles. On the other hand, the sanction for a light railway of 5.8 miles between Dori and Hoko in Kankyohokudo, given to S. Ishii and two others, was cancelled.

The open lines at the end of the year reached 22.3 miles and their capital amounted to Yen 9,026,600 in all, Yen 4,819,149 of the amount being paid up while the cost of construction was Yen 2,169,855. These lines belong to the Nikkan Gas Electric Co., Chosen Gas Electric Co. (gas and electric business transportation) and individuals (tramways in Heijyo and Waikan), and those not yet taken up though sanctioned, aggregate to 150.3 miles.

The Kannan and Kanhoku Light Railways (aggregating 88.2 miles of a gauge of 2 ft.) which belong to the Finance Department of the Army stationed in Chosen were constructed during the war in 1904-5 for the conveyance of military ammunition and provisions. Afterwards offices were established at Seishin and Kanko for the transportation of soldiers, officials, military provisions and materials. Besides, public transportation is allowed under contracts with contractors at Kanko and Seishin under the supervision of the offices.

AMERICAN CHAMBER OF COMMERCE

An enthusiastic assemblage of American business men was present in the Palace Hotel banquet room, in Shanghai on September 18, when the organization of the American Chamber of Commerce of China was completed by the adoption of constitution and bylaws prepared by a temporary committee appointed at a previous meeting and by the election of a permanent committee and officers. The following were chosen as committee:

Mr. Larz Anderson of Mustard and Company, Mr. C. H. Blake of the Standard Oil Company of New York, Mr. J. Harold Dollar of the Robert Dollar Company, Mr. F. A. Fairchild of the China and Japan Trading Co., Mr. J. W. Gallagher of the United States Steel Products Company, Mr. J. N. Jameson of Wisner and Company, Mr. J. H. McMichael of Frazar and Company, Mr. N. T. Saunders of Geo. H. Macy and Company, Mr. J. B. Southmayd of the Singer Sewing Machine Company, Mr. P. F. Wisner of P. F. Wisner and Company.

The following were elected officers for the ensuing term: President, J. H. McMichael; Vice-president, J. W. Gallagher; Secretary, P. L. Bryant.

Honorary membership as provided in the bylaws was conferred upon the American Minister at Peking, the Chargé d'Affaires, the Commercial Attaché, the Consul-General and Vice-Consul-General at Shanghai. Owing to the great interest shown by Consul-General Thomas Sammons, it was proposed that the bylaws be amended to permit his election as Honorary President of the Chamber.

As the Chamber will take steps to affiliate with the Chamber of Commerce of the United States, the national body whose recommendations have resulted in the passage by Congress of many measures for the benefit of American business, it is expected that the local Chamber will be of wide influence, working through the national organization, for a better understanding of conditions in China on the part of American manufacturers and others interested in Oriental trade.

The committee has already formed plans for an active canvass of Americans who are eligible with a view to enrolling every individual and firm or corporation, in addition to the large number that have already taken out membership in the Chamber. The temporary office of the Secretary is 5, Jinkee Road, Shanghai.

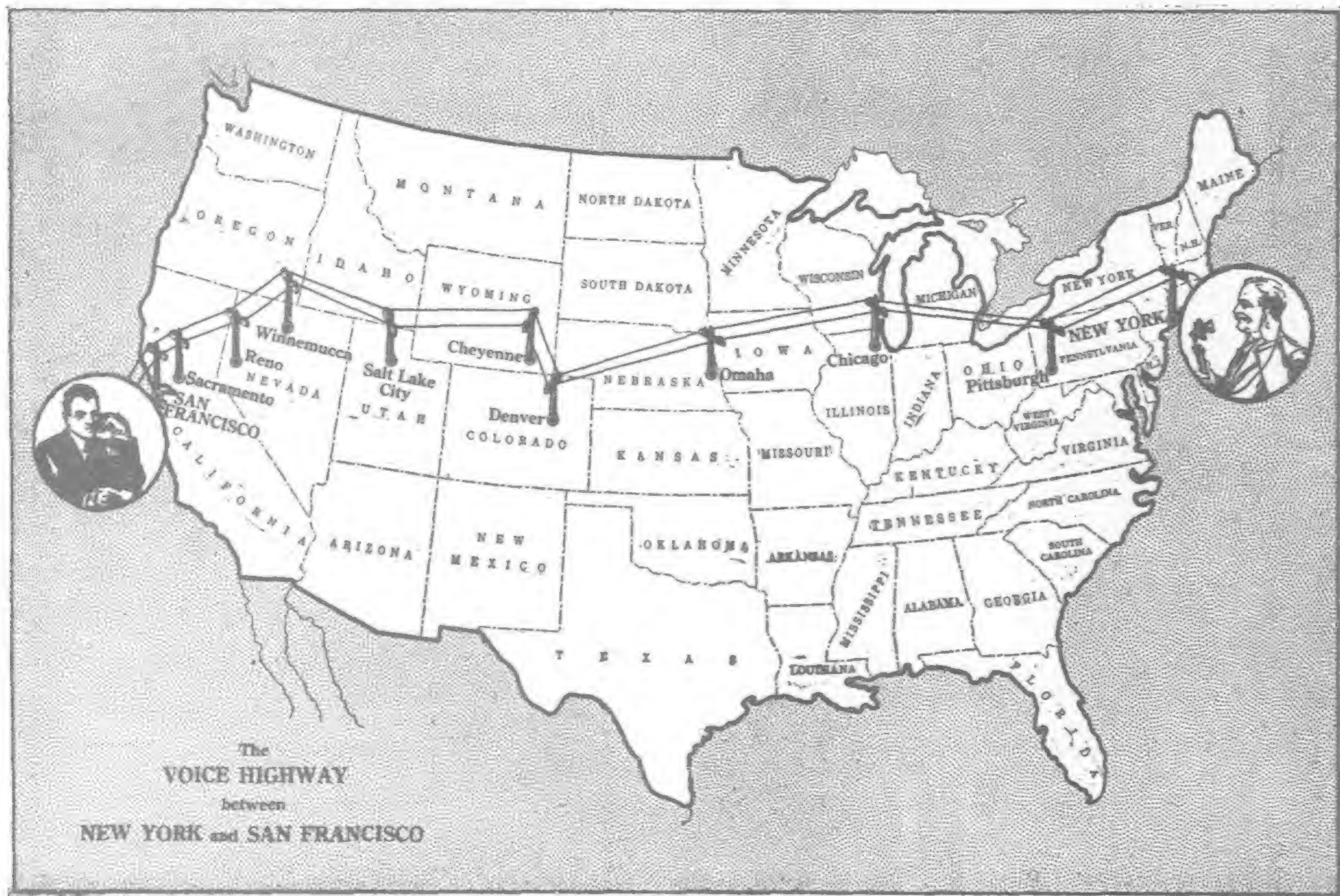
Chinese Visitors Use Trans-American Telephone

Among the first persons to use the new long distance direct telephone between New York and San Francisco were Messrs. Yingming Chang, Chi Cheh Nieh, David Yui, Chachsin Pian, S. C. Thomas Sze, and Chaichang Woo, all of the Chinese Commercial Commission party, who were entertained in New York on June 5th, by the Western Electric Co., during which, through the courtesy of the American Telephone and Telegraph Co., each of the gentlemen was given an opportunity of talking to San Francisco over the long distance line. Arrangements were made in San Francisco to have the Chinese Consul General and the Chinese Commissioner at the Exposition do the talking at that end of the line. No trouble was experienced during the several conversations and the gentlemen were probably quite surprised to find they could talk over the 3,400 miles with little more effort than over a local connection.

This interchange of spoken communication between the great metropolis of the West and the great metropolis of the

East is worthy of note that this transcontinental voice highway has been completed and given over to public service during the lifetime of Alexander Graham Bell, the inventor of the telephone, and it seems most fitting that he was the first man to talk over it to that other man, Thomas A. Watson, who, as Professor Bell's assistant, heard the first words ever spoken into a telephone.

To make ocean-to-ocean talk possible, it has been necessary to do a well-nigh perfect piece of line-construction work. The external evidences, poles and wires, important as they are in themselves, give only the faintest ideas of the years of ceaseless research and experimental work by the American Telephone and Telegraph Company that have resulted in this talk-link between West and East, an accomplishment representing the last word in telephone science. With this study has come the improvements in line construction, cable, receivers, transmitters, switchboards and all the other telephone apparatus needed to send the delicate electric voice currents over the 3,400 miles that separate New



York and San Francisco and deliver them at either end undiminished in volume and undistorted.

East was proclaimed to the world as one dream of the telephone engineer that has been realized. It means direct speech between two points 3,400 miles distant, telephonically speaking, over wires that traverse mountains, valleys, deserts and lakes, a line whose direction involved the most difficult problems met with since the inception of the telephone in 1875.

In 1849, transcontinental travel consumed five months by stage coach. In 1859, by sailing vessel around Cape Horn it required three months to reach San Francisco from New York. Ten years later the railway abridged the distance to twenty days. The opening of the Panama Canal in 1914 made it possible to do the journey in sixteen days by steamship, while the beginning of 1915 shows a railway record of 71 hours and 27 minutes, with an average time of 90 hours. By transcontinental telephone line a man's voice and personality reach the far end in one-fifteenth of a second.

An idea of the quantity of the line material used may be gained from the fact that there are four copper wires each 3,400 miles long and of No. 8 B.W.G. gauge, producing a total weight of 5,920,000 pounds or 2,960 tons. In the line itself there are 130,000 poles.

The Western Electric Company which supplied all of the line construction material and telephone apparatus used in conjunction with this transcontinental voice highway has issued an attractive folder showing a map of the line, views taken during its construction and reproductions of drawings and photographs depicting the opening of the first long-distance line between Salem and Boston, Massachusetts, in 1877, the line between New York and Chicago in 1892 and that between New York and Denver in 1911.

Constructing Voice Highway Across the United States



SURVEYING THE LINE



CONSTRUCTION CAMP MOVING



BORING POLE HOLES IN HUMBOLDT LAKE, NEVADA



HAULING 18-FOOT REDWOOD POLES



SETTING POLE IN HUMBOLDT LAKE, NEVADA



SETTING POLE NEAR STONE HOUSE, NEVADA

ENGINEERING, FINANCIAL AND INDUSTRIAL NEWS

RAILWAYS

Chefoo-Weihsien Line.—The Chinese Chamber of Commerce at Chefoo estimates that the cost of the Chefoo-Weihsien railway will be about Tls. 10,000,000, without counting a branch line from Lungkow to Weihsien. Telegrams have been despatched to the various provinces regarding raising of funds and it is expected that Chinese merchants in Shantung and the Chambers of Commerce throughout the republic will subscribe. The Central Government probably will advance Tls. 5,000,000. Directors of the Chinese Chamber of Commerce at Chefoo are consulting the leading merchants at Chefoo, Tsinan, Chowtsun and other Shantung cities, to find out what amount they will subscribe. It is understood that the Government intends to make the line a semi-official one. Chinese reports state that the Chefoo Chamber of Commerce at first approached the leading British merchants of Chefoo but the Japanese opposed their participation on the ground that, if foreign capital is required for this railway, the preference must be given to the Japanese.

British Railway Concessions.—According to a London Dispatch Lord Robert Cecil, Under-Secretary of the Foreign Office, stated that no agreement existed with China regarding Railway development by British subjects or with British capital, though agreements signed with British syndicates were communicated to the British Legation in Peking. The Chinese had promised, he said, that certain railway concessions, for which a British subject was negotiating, whether granted to that firm or not, should be reserved for British subjects. In view of the foregoing, the Japanese versions emanating semi-officially from Tokyo may be of interest.

The statement of Lord Robert Cecil in the House of Commons refers to the line between Nanchang and Canton. However, the British people are trying to secure a line between Hangchow and Nanchang and Wuchang also, which fact is worth noting. Lord Robert Cecil, the Under-Secretary of the Foreign Office, has stated in the House of Commons that certain railway concessions in China would be reserved for British subjects. This is believed to refer to the railway concessions which, it has been reported, Messrs. Pearson and Company had contracted for, namely the railway line between Canton and Nanchang. However the line between Kiukiang and Nanchang as well as that between Chaochowfu and Swatow are built with Japanese loans and it is not morally good to grant the line between these two railways to another foreign concessionaire, and it is argued by the press of Tokyo and diplomatic circles in Tokyo that the British Government will pay due respect to the position of the Japanese Government in the matter.

Shantung Railway Repairs.—The repair work of the Shantung Railway, which has been going on since last winter is now completed and the time occupied between Tsingtau and Tsinanfu soon will be shortened about an hour; Owing to a freshet which carried away the Railway bridge between Fangtzu and Tsosban, July 27, the goods traffic was interrupted and the new schedule deferred.

Chinghsien-Dolonor Line.—According to a Consular report the Chinese Government is planning to construct a railway from Chinghsien to Dolonor. A party of officials from

the Ministry of Communications has been sent to survey the projected line. It is said that the line will comprise a distance of 1,100 li, and that a certain foreign bank has offered to loan the funds for the construction.

Railway to Yunnan Mines.—Plans for a railway from Mengtze, Yunnan Province, China, to the Ko-chiu tin mines, are nearing fruition as the Chinese capitalists concerned in the tin mines have recently employed two French engineers in connection with the enterprise. The original plans and the actual location of the line were made by American engineers, who resigned several months ago. The plans call for a 60-centimeter track, and rolling stock estimated at 8 locomotives, 100 freight cars, and 15 passenger cars.

Canton-Kowloon Railway.—According to the annual report of the Kowloon-Canton Railway, British Section, presented to the Legislative Council, the general development of traffic on the railway, with additional locomotives and rolling stock, made the extension of the locomotive and carriage accommodation at Hunghom, a necessity. It was found that the present site was capable of expansion sufficient to serve for many years to come, a definite scheme was drawn up, and it was arranged to carry out only so much of it as was immediately necessary. These extensions include the re-arrangement of the tracks, and an order for the necessary points and crossings and permanent way has been placed through the Crown Agents. The gross earnings for the year were \$364,608.32, as against \$333,633.32, for 1913, an increase of \$30,975. The working expenses amounted to \$274,366.39, an increase of \$28,557.81 due to the increased price of coal. The balance after paying working expenses stands at \$90,241.93, or \$2,417.19 more than the previous year. No accidents occurred during the year.

Canton-Hankow Railway.—The line at present is almost completed as far as Shiu Kwan (Chiu Chow), 140 miles from Canton, and it is expected that traffic soon will be opened with that place. The work of the last 20 miles has been delayed two years beyond the time originally planned on account of heavy rock cuts, tunnels, and troubles with the contractors. The revolution also caused considerable delay.

Beyond Shiu Kwan station the only work which has been completed is about 3 miles of grading piers for the bridge over the North River (East Fork) at Shiu Kwan, and part of a long tunnel about 12 miles beyond Shiu Kwan. It is not likely that the Kwangtung Yueh-Han Railway Co. will build any further unless it is decided to open the coal mines north of Shiu Kwan. Beyond Lok Cheong (170 miles from Canton) the line runs through rugged country, and will have no local traffic until Ping Shek, on the Hunan border, is reached. It is expected that the Government will take the line from Shiu Kwan to the Hunan border.

The construction of the line is of fair quality. Eighty-five pound rails of American, Belgian, and Hankow manufacture are used. Steel girders and trusses are nearly all from the American Bridge Co. and are of the best design and workmanship. Some of these articles, purchased from Europe, are of poor design, and one 200-foot span is very bad. The locomotives are products of the Baldwin and the American Locomotive companies. Last

year five consolidated locomotives were purchased—three from the American Locomotive Co. and two from the Baldwin. The passenger cars are mostly of American manufacture, as are also the box cars, although some of the latter are of English construction. It seems likely that the short English cars will soon be rejected and that only the 8-wheel American cars of all classes will be used.

Some steelwork, such as tanks, turntables, warehouses, etc., has been imported from America, and much Oregon pine for false work, ties, etc., has been and is being purchased there, but these articles are usually placed by Japanese, German, or English firms, for the reason that the American manufacturers are not adequately represented at Canton.

The passenger traffic represents about 60 per cent. There is also a good business in the transportation of cattle, firewood, limestone, and other products, such as rice, tobacco, poultry, etc. Later on coal will be brought down, but as this is anthracite, it will be necessary to establish a market before it can be handled. Salt is sent over the line from Hunan and the upper North River districts. On the whole, the traffic is satisfactory, and a large increase is expected when the line reaches Shiu Kwan, but the railway can not be expected to pay well until it has been completed to Hankow or Shanghai, when it should be the most important section of the railway and the most profitable in China.

The line is well located, fairly well constructed, very well maintained, and should be profitable if well managed.

The country through which this railway passes produces mules, cattle, pigs, rice, lumber, coal and a considerable quantity of tobacco and poultry. At Ho Tow are large limestone hills, also many mines, some supposed to produce silver and gold.

Japan's Five Concession Lines.—The railway concessions acquired by Japan by virtue of the recently concluded Sino-Japanese treaty consist of five new lines, namely Changchun-Chaonan line, Chaonan-Jehol line, Ssuninghai-Chaonan line, Haiyuan-Hailung line and Hailung-Kirin line. On the conclusion of the detailed arrangements, the work of construction will start with part of the Ssuninghai-Chaonan line, extending for 52 miles between Ssuninghai and Tingchiatung. The construction fund is to be defrayed by the Yokohama Specie Bank and construction work will be taken up by the South Manchuria Railway Company. The next line to be constructed will be that between Haiyuan and Hailung.

Chinese Railway Mileages.—The mileage of the Tsin-Pu, Ching-Han, Peking-Mukden, Peking-Kalgan-Suiyuan and Shanghai-Nanking Railways are as under:—

Tsin-Pu Line, 682 miles including 54 miles of branch lines;

Peking-Hankow Line, 829 miles including 70 miles of branch lines;

Peking-Mukden Line, 603 miles including 79 miles of branch lines;

Peking-Kalgan-Suiyuan Line, 215 miles including 13 miles of branch line.

Shanghai-Nanking Line, 203 miles including 10 miles of branch line.

S. M. Railway Material.—The British Consul at Dairen has furnished the following statement showing the values of the railway

supplies purchased from foreign countries by the South Manchurian Railway Company during 1914; the figures for 1913 are added for purposes of comparison:—

crop failure of last year and the September floods are held responsible for the decrease shown in freight earnings on those lines for 1914, were points emphasised by Governor

		United Kingdom.	United States.	Germany.	Other Countries	Total.
Iron, steel, &c.	1914	27,519	11,651	—	6,032	45,202
	1913	48,185	1,854	583	442	51,064
Timber	1914	—	380	—	1,946	2,326
	1913	—	19,746	—	1,727	21,473
Machinery.....	1914	15,270	7,596	14,515	410	37,791
	1913	43,494	12,302	45,354	172	101,322
Rails and accessories.....	1914	5,401	—	—	10,970	16,371
	1913	2,564	5,247	5,457	378	13,646
Locomotive and rolling stock construction material	1914	9,266	3,765	94	—	13,125
	1913	24,317	27,260	12,978	2,756	67,311
Electrical apparatus	1914	601	655	32,417	128	33,810
	1913	7,132	280	14,139	135	21,686
Building materials	1914	1,025	399	—	—	1,424
	1913	14,341	7,678	803	—	22,822
Oils.....	1914	—	21,491	—	319	21,810
	1913	—	16,976	—	473	17,449
Sundries	1914	14,836	10,956	2,516	3,265	31,573
	1913	69,877	1,097	3,966	194	75,134
Totals	1914	73,918	56,893	49,542	23,070	203,423
	1913	209,910	92,440	83,289	6,277	391,907

(C.I.B. 29,780.)

S. M. Railway Doubles Track.—The South Manchuria Railway has received permission to double the track on the Suchiatun-Mukden Section on the Main Line. This construction work will extend over four years. The construction of a railway bridge for the second track over the Hun River is in progress.

S. M. R. Traffic Returns.—For the first time in the new fiscal year, the South Manchuria Railway's traffic returns have showed a decrease from the returns for the corresponding period of last year. The daily average for the first decade of the current month was Y35,568, being Y392 less than the figures for the same period of last year. The total traffic receipts from April to August 10th reached Y8,059,440.29 and the excess over the last year's earnings to the end of July was Y1,077,609.81.

Amur Railway Open.—Rails were joined at Oblutaye, and traffic opened on the western section of the Amur Railway, the first train passing through in March. The work of completing the line is progressing satisfactorily.

New Philippine Railroad.—A new railroad corporation, capitalized at P500,000, has been incorporated in Manila to build and operate a narrow gauge road in Occidental Negros, from the port of Pulupangdan to La Isabela, a distance of some 60 kilometers. The company, called "Ferrocarril Agrícola Pulupangdan-Isabela," is the first ever organized by Filipino capitalists for a like purpose. The road will pass through La Carlota, La Rama, Zaragoza, La Granja, Danao, and Castellana. The company reserves the right to engage in general and agricultural and passenger transportation by rail, as well as to operate boats for sugar export from any port in Negros to Iloilo. The capital stock of P500,000 is divided into 2,500 shares of P200 each, and 500 shares have already been subscribed for by the incorporators, while P25,000 in cash has been paid in. Eusebio Lopez is treasurer with offices at Iloilo until the line is in operation. The railroad will pass through a fertile region yielding at least 70,000 tons of freight per year, to be increased as further sugar acreage is developed. The estimated population is 110,000.

Manila Railroad Interest.—Business depression in the Philippines contributed to the falling off of revenues on the northern lines of the Manila Railroad company while the rice

General Harrison in a statement explaining the causes which have led to the necessity of meeting guaranteed interest charges on railroad bonds from government funds. Though not the first time in the history of the Philippine government, the four per cent interest guaranteed on bonds of the Manila Railroad company is being paid by the government and the total amount probably will reach P80,000. According to the statement, the year 1914 shows the greatest operation revenue on the northern lines in the history of the road with the exception of the year 1913. The falling off over 1913 amounted to P288,063.77. There was a falling off in freight earnings of P119,183.76, or approximately 9 per cent. There was a sympathetic falling off in passenger earnings of P164,358.21, or less than 8 per cent. At the same time, the operating expenses for 1914 exceeded those of 1913 by P100,706.84. The complete statement of comparative revenues and expenditures for five years follows:

NORTHERN LINES					
	1910	1911	1912	1913	1914
Freight Earnings	849,886.61	968,877.40	918,380.33	2,272,544.92	1,153,361.16
Passenger earnings ...	1,600,006.22	1,807,828.18	1,981,122.00	2,138,828.73	1,974,470.52
Total operation revenue ...	2,494,785.60	2,780,931.66	2,925,171.04	3,440,812.11	3,152,748.34
Maintenance of Way and structure	315,341.59	414,365.57	391,866.66	442,802.92	443,204.40
Maintenance of Equipment	114,393.29	161,371.04	200,486.77	267,669.44	316,732.63
Traffic	31,833.66	32,463.66	27,828.33	30,530.17	33,494.74
Transportation	458,914.97	519,619.20	595,743.18	736,260.07	782,409.46
General	121,340.96	129,338.73	140,482.96	140,563.59	151,601.71
Total	1,072,974.47	1,257,158.20	1,356,407.30	1,626,826.19	1,727,533.03
SOUTHERN LINES					
	1911	1912	1913	1914	
Freight Earnings	176,634.78	340,157.31	448,432.15	538,996.72	
Passenger Earnings	579,716.76	1,090,889.62	1,320,671.77	1,273,085.04	
Total operating revenue	761,850.16	1,443,042.57	1,795,675.66	1,839,985.92	
Maintenance of Way and structure.....	66,073.93	177,954.14	203,025.40	275,427.62	
Maintenance of Equipment.....	37,625.60	88,112.72	117,133.46	166,228.82	
Traffic	10,621.84	14,848.07	18,310.52	19,719.93	
Transportation	147,624.23	318,827.62	482,606.38	536,179.69	
General	34,051.90	68,435.54	92,395.16	95,461.80	
Total	295,997.50	667,278.09	913,470.92	1,093,017.92	

Indian Railways' Deficit.—The deficit in the earnings of State and guaranteed railways in India as between April 1st and June 19th has now passed the figure of Rs. 20 lakhs, and on other lines the deficit exceeds Rs. 10 lakhs, making an aggregate falling off of Rs. 30,75,594. The improvement in Oudh and Rohilkhand earnings now stands at Rs. 9,53,862; the East Indian receipts at Rs. 5,66,930, the next

best record standing to the credit of the North-Western with an increase in earnings of Rs. 4,42,367. The deficit in the earnings of the Bombay, Baroda and Central India 5ft. 6in. gauge now stands at Rs. 6,73,355; to which must be added Rs. 7,95,543 in deficit on the 3ft. 3 $\frac{3}{4}$ in. gauge. In the week ending June 19th Great Indian Peninsula earnings show a slight improvement, but over the longer period the decreased receipts aggregate Rs. 8,25,993. The returns for Southern India reflect trade conditions not entirely uniform, South Indian receipts showing a decline of Rs. 4,49,968, not including reaction of Rs. 3,87,421 on the Travancore branch; the Madras and Southern Mahratta, on the other hand, claiming an improvement of Rs. 1,07,163, also showing improved earnings in the particular week under mention.

New Indian Railway.—The Kalighat-Falta Railway Co. has organized with a capital of 1,700,000 rupees (\$551,536) to complete a 26-mile railway on 2 $\frac{1}{2}$ -foot gauge from Kalighat to Falta, Bengal. The line will be constructed and worked by Messrs. McLeod & Co., Calcutta, as managing agents under a board of directors and subject to close Government supervision. The line will run through one of the most densely populated parts of Bengal, the density of population being more than 1,100 per square mile. This is more than double the average density of Bengal which is 551 per square mile. The only present means of passenger transportation is by hackney carriage or on foot, and although the usual fare on Bengal light railways is 4 pies (\$0.0067) per mile, judged by the third-class passenger traffic on other railways in India, the passenger traffic is expected to yield at least 6 per cent on the capital invested. Almost every foot of the ground through which the line runs is under cultivation, and as the only means of transportation heretofore has been the bullock cart, it is estimated that the freight traffic will be immense.

Bangkok's New Station.—The Bangkok terminal station of the Northern Railway has been under construction for several years, and

a \$44,400 contract has now been awarded for the final frontage buildings. With the completion of these structures, Siam will have one of the most up-to-date railway stations in the Far East. The contract was awarded to the Bangkok Dock Co. (Ltd.)

The work on the Southern Line of Railways is proceeding satisfactorily, and the final rails linking Singora with Bangkok were laid early in May, 1915. The line will be open for regular traffic in June, 1916.

Australia's New Railways.—Public works involving an expenditure of more than \$50,000,000, including ten railway lines, two water conservation schemes, harbor works and a canal project are provided for in a single contract just signed by the New South Wales government with an Anglo-Australian contracting firm, Norton Griffiths & Company. The contractors agree to finance the operations, which will be done in accordance with plans drawn up by the department of public works. The Government will allow the firm a profit of five per cent on the entire cost of construction.

Railway Construction in Japan.—A general policy for railway construction has been laid down by the Government to complete within 10 years, an addition of 1,219.5 miles to the mileage already worked. During the present fiscal year new lines of 79.5 miles will be completed and opened to traffic. Within the succeeding six years 238.3 miles will be completed, while the remainder is not yet assigned for the lack of capital. All light railway lines, a total of 331.3 miles, are postponed until the year 1916-17, or later. The Railway Board has appointed a committee, to investigate the proposed conversion of the present narrow gauge railway system into broad gauge. The committee is headed by Dr. Furukawa, vice-president of the board. It is said that the tunnels for the Atami line, now under construction, will be built so that they can be converted into a broad gauge system in the future without reconstruction.

TRAMWAYS

Street Railway for Canton.—Plans for a street railway system for Canton connecting the stations of the Canton and Hankow Railway and the Kowloon-Canton Railway, and running through a populous portion of the city, have been drawn and forwarded to Peking. General Lung, military governor of Kwangtung Province, in connection with Chinese capitalists in Hongkong, has projected this line of 6 miles along a route which will permit the use of a considerable portion of the old wall of Canton. The line will proceed from the Canton-Hankow Railway station to the east wall of the city which it will follow to the south wall, where it will parallel the water front on the Pearl River, passing within about a third of a mile of the foreign concession on the island of Shameen. It will reach the river front proper near the station of the Kowloon-Canton Railway line—the line to Hongkong. Plans for the rolling stock are not yet complete, but the general idea seems to be to buy motors and steel parts of cars abroad, setting up the cars in Canton or Hongkong, to save freight rates on complete cars. An initial outlay of about \$100,000 gold is planned. The practical management of the enterprise at present is in the control of Mr. Chin Gee Hee, president of the Sunning Railway Co., working in consultation with General Lung.

Tokyo Tram Suffers.—Since the opening of the government electric train service between Tokyo and Yokohama, the directors of the Keihin Electric Railway, a private line, say the revenue of their company has decreased forty per cent. Officers and directors have asked Count Okuma to help them out of their difficulty. Dr. Furukawa, Vice-President of the Railway Board, says that wherever a private railway line parallels a state line an agreement on rates is entered into because competition will do neither any good. The lines between Tokyo and Yokohama are no exceptions. But since the opening of the electric train service between the two cities,

the business of the Keihin Dentetsu Kaisha seems to have been affected and complaints have been heard from the authorities of the company that the continuation of the existing rates means a hardship. The Railway Board in response announced the abandonment of the agreement and allowed the private company to adopt any rates they liked.

ELECTRICITY

Lucban, P. I., Hydro-electric Plant.—The Frank L. Strong Machinery company has closed a contract with the Lucban Electric Light and Power company to install a hydro-electric plant in Lucban, Tayabas, the first of its kind to be introduced in the Philippines for municipal lighting purposes. The proposed plant will cost \$30,000. The machinery will be purchased from American makers and the plant is expected to be ready for operation this month. The project will be financed by Filipino capital through a corporation floated in the municipality. The power for the plan will be generated by the water of the Pagsipi River, which flows through the municipality. The electric-light and power system will consist of a Pelton water turbine, connected with a General Electric alternator, a concrete dam across the river, a head gate, flume penstock, a complete power plant, transmission, and distributing line. The system will require 42,000 feet of wiring and 1,600 feet of flume line, with a capacity of 900 liters a second. Lucban is one of the centers of the Philippine hat industry. One of the incentives for constructing the new lighting and power system was the great need for better lighting in the homes where the hat industry is being conducted.

Tayabas Power Site Grant.—Presaging the organization of an enterprise which will be able to supply the whole province of Tayabas with electric light and power, the Philippine government irrigation council has approved a water rights request made by a coterie of Manila and Tayabas residents through W. E. Stevenot, a Manila engineer, by the terms of which the rights to 50,000 feet per second on the Canan river and 26,000 feet per second on the Agos river in that province have been granted to establish an electric light and power plant. This grant is one of the largest that has ever been made by the insular government, and it is asserted that there is practically no limit to the amount of electric current that can be generated by the proposed plant if proper use of the water power thus placed at its disposal is made. Those who have been most concerned in securing the grant from the government are unwilling to make any definite statement as to the identity of the capitalists behind the project or as to the exact nature of the plans in view, holding that such a statement at this time would be a trifle premature. It is understood, however, that expert engineers will go over the ground thoroughly, and that practically all preliminary steps toward securing the proper franchises have already been taken.

Zamboanga's Electric Lights.—Mr. Teague, proprietor of Zamboanga Cine, has bought a 50-horsepower engine which he is now installing in the Zamboanga theatre, and announces that he soon will be able to supply the entire city with electric light.

To Extend Sungkiang Plant.—After having been installed a little over a year, electricity has proven so popular as an illuminant in Sungkiang, Kiangsu Province, that the plant has reached its limit. The Company plans to increase its output and to this end has sent out circulars notifying the people

that those who want electricity must lay down a dollar for each new lamp desired. The company, so far, has given efficient service.

Dairen Electric Light Service.—The South Manchuria Railway Electricity Works has received Y36,266.89 in lighting receipts and Y8,910.27 in power receipts, being an increase by Y2,783.90 and Y730.55 respectively on the figures for the corresponding month of the previous year. The latest returns put the number of lamps served at Dairen at 58,126, being an increase by 278 over the previous month.

Electric Light at Kirin.—A group of Chinese merchants at Kirin have applied to the Chinese authorities there to take over management of the electric light installation. They are said to have collected 3,000,000 taos for the purpose. Gov. Meng has instructed them to confer with the Provincial Bank about the details.

Extension of India's Hydro-Electric Works.—Additional areas have for some months past been under investigation with a view to the future expansion of the Tata Company's Hydro-Electric Works. The first section of the new undertaking will be in the Andra Valley about 9 miles North-North-West from Walwhan Dam where a lake has been laid out to supply nine thousand millions of cubic feet of water, and the site chosen for the Power House is near the village of Bhivpuri about 12 miles north of Khapoli, the site of the present power house. It is found that a development capable of supplying at least 60,000 Electrical Horse Power for 12 hours daily in Bombay can be had at a cost much below that of the Company's present work, which should enhance materially the future prospects of the company. The next valley to the north, or the Bhama Valley, has also been surveyed and is being planned to supplement and extend the Andra Valley project. Between the two it is anticipated that considerably more than 100,000 electrical horse power can be made available. The catchment areas are so large that a moderate rainfall will suffice.

Karachi Power Station.—The following is a description of the plant employed in the central generating station of the Karachi Electric Supply Corporation recently declared open:—

The engines are two 240-h.p. and one 100-h.p. Mirrlees Diesels, and run on crude oil, which can be obtained at rupees 40 (£2.10s) per ton. As the engines take only 5 lbs. of oil per horse power per hour the cost per horse power hour is a very notable reduction in cost over steam. The cooling plants are duplicated, as they are very essential to the running of the engines. A Tudor battery, consisting of 276 cells, is installed with the object of supplying electricity to consumers during periods of high load. The battery is charged through two boosters during periods when the engines are running, and the cost of charging the battery is therefore very small.

A white marble switch board is mounted on a platform seven feet above the engine room floor level, and contains the switchgear for all machinery in the power house, and the feeders going out to the overhead mains. A small auxiliary switch board for controlling the station lighting is also mounted on the platform. The distribution is on the three wire system, electricity being generated at 440 volts, and supplied to consumers at 220 volts. For balancing the system two balancers have been installed, each capable of dealing with an out of balance of 75 amperes.

The supply mains are carried overhead, and consist of stranded copper cable carried on porcelain insulators on steel poles. For the protection of the public the neutral wires are carried in parallel underneath the live wires,

and are linked across twice in every span. In the event of a live wire breaking it would fall across the neutral wire, and an automatic switch operating in the power house would at once cut off all electricity from the mains. At suitable points on the overhead mains, link and feeder boxes have been provided, which enable any portion of the system to be disconnected from the supply, and prevent the interruption to supply due to a breakdown on any portion of the mains. The mains and poles have been designed to carry double the load it is estimated that Karachi will require for the next two or three years, and the cost for extensions to mains should therefore not be a large item during the next few years.

Japan Standardizes Plants.—The Communications Department has just effected modifications in various regulations governing electric enterprises and the installation of isolated power plants, and has published new regulations governing the supply and distribution of power. According to the official explanations offered, the main points of those modifications are the enforcement of the unification of the number of periodicity and the distribution pressure of the generator; the simplifications of the formalities of conveying power plants in accordance with the Factory Mortgage Law; the facilitation of the power transmission from one circuit to another in the case of the collapse of a power plant; the strictest enforcement of official examination of private companies, power distribution, supply terms and procedure; and the simplification of the other official formalities concerning the supervision of private electric enterprises.

RIVERS, HARBORS AND CONSERVATION

Chefoo Harbour Improvement.—The Contractors for the improvement of the Chefoo Harbour have begun actual work, the inauguration taking place on August 2, in the presence of many Chinese and foreign authorities, with some ceremony. The big bucket-dredger "Colonia" was officially started and moving slowly at first scooped up the first bucket full of the harbour bottom, opposite Tower Hill, thus beginning the dredging of a channel under the projected eastern breakwater. The end of the breakwater—which will be 2,600 feet in length—is marked by a black spar-buoy, to the port of which entering vessels are to pass. A few days after the dredging of the channel was begun stone was dumped into it to form the foundation of the breakwater. On the west beach the necessary godowns, workshops, and a jetty are being constructed. The dredging plant consists of the bucket dredger above mentioned, three powerful tugboats, and four self-discharging barges. Next spring a suction dredger and more tug-boats and barges will arrive.

To Build Chefoo Breakwater.—As a result of public tender the construction of the breakwater at Chefoo has been awarded to the Netherlands Harbour Construction Company of Shanghai. The lowest tender offered by a Chinese contractor of Chefoo was rejected as he could not find suitable guarantee, his quotation being \$2,340,000 and the Dutch Company's \$2,677,000. The funds necessary for this enterprise will be advanced by the Russo-Chinese Bank in the first year and from the Russo-Chinese Bank and Hongkong and Shanghai Bank thereafter.

Puyang Work Finished.—A recent Presidential mandate enumerated the merit of the work for the conservancy of the Puyang River, in which over \$5,000,000 was spent and

which was concluded late in June, by which the people of three provinces—Chihli, Honan and Shantung—will receive great benefit. Deep appreciation is expressed in the Mandate. Hsi Shih-kwang, who superintended the work, has been rewarded with the 4th rank of merit. Wang Huai-ching, the Commissioner of Defence of Kweinan, is allowed to have all his "black marks" erased. \$10,000 has been granted to the sappers of the River Conservancy who engaged in the work and \$3,000 to sappers sent to help them by the Commissioner of Defence of Kweinan.

Reclamation Work in Korea.—It is reported that great activity is in evidence in the reclamation of waste lands along the shores of South Chonla Province. These lands can easily be converted into arable fields; and, as this district is one of the richest agricultural sections of Chosen, several prominent men in Japan have interested themselves in the experiment to the extent of applying to the Government General for permission to undertake the work. It is expected that the work will be commenced in the spring.

Resounding Dairen Harbour.—Lieut. Commander Ogawa and party of the Hydrographic Office of the Navy Department, Tokyo, have been taking resoundings in the Dairen Harbour since the latter part of April. A member of the party has made the following observations:—The last soundings of Dairen Harbour were taken in 1905. In the succeeding ten years changes have come over which discount the value of the figures on the existing charts. It was for this reason that the present re-soundings have been taken up. Firstly, the shore lines are to be surveyed as they are. Secondly, the changes in the currents are to be marked. Thirdly, soundings of immediate coast waters are to be taken. Already the surveying and resounding work in what is usually accepted as Dairen Harbour has been completed, and what is left to be done consists of the Basin and other water areas inside the Breakwater in addition to the shore area in front of Jijiko.

Tsingtau Harbor Clear.—With the exception of one ship all those sunk in the neighborhood of the port of Tsingtau have been floated by the Japanese navy and vessels may now visit the port safely. The Japanese naval authorities at Tsingtau announced that warships and other vessels would be permitted to enter the main port of Tsingtau on and after June 10, although they were requested not to interfere with the work of floating of the one remaining vessel sunk at a point west of the entrance to the port.

Improving Port of Cebu.—The work of improving the port of Cebu is being rapidly pushed by the bureau of public works. The waterfront has been dredged to a depth of 19 feet from the market to the angle in the sea wall, and to 25 feet from the angle to the Custom House. The dredge is now working in front of the new wharf, lowering its depth to 30 feet. The area behind the new wharf and adjoining the U.S. Club is being filled. Cebu soon will be one of the best equipped ports in the Far East with its 3,000 feet of concrete sea wall with berths for two steamers drawing 30 feet of water, a fifty ton crane available for heavy lifts, and asphalt paved street approaches. The engineers in charge estimate that all the improvements now under way will be completed within the next two months.

New Projects.—In accordance with the contract award announced some time ago, the Atlantic, Gulf and Pacific company has been engaged for a month in preliminary dredging and pile-driving work connected with the construction of the new concrete bulkhead

between piers 3 and 5. This contract calls for an expenditure of approximately P.200,000 of government funds. Meantime work has already been begun by Contractor John Gordon on the new buildings for the Philippine school of arts and trades, which are to cost in the neighborhood of P.171,000.

Contractor J. E. Ainsworth of Manila has already been awarded the Iloilo river wall contract as well as that for the Mainit bridge in the same province.

TELEPHONES AND TELEGRAPHS

Foochow Telephone Service.—Two telephone companies operate in Foochow—one small foreign-owned exchange connecting only the firms and residences in the foreign quarter at Nantai, and one native-owned exchange operating in Foochow city and all immediate suburbs. The foreign-owned exchange is operated and controlled by a local German firm. The switchboard provides 50 connections. There are 40 subscribers, an annual rate of \$70 (Gold \$28) being charged for either the desk or wall instrument. The exchange has only 3 miles of wire, the line being of the single-wire system.

The Chinese-owned exchange is known as the Fukien Telephone Co. The company began operation in 1903 and is capitalized at \$45,000. The property is valued at \$60,400, and during the past year a profit of \$7,400 was realized. The demand for telephone service through this exchange has gradually increased, and the subscribers now number 320. The length of wire in use is 140 miles. Six switchboards have been purchased, four being of British and two of Norwegian manufacture. With the exception of one 200, the switchboards provide for connections of 100 each, and five of the switchboards are in use at present.

Most of the telephone supplies have heretofore been purchased in England, a fair amount having also been imported from Germany and Norway. The subscription rate for the ordinary wall instrument is \$60 (Gold \$24) per year, and for the "microphone" style (Gold \$28.80). The telephone service of the native exchange has greatly improved of late, and the company is now installing the double-wire system. There are three branch exchanges, but one will be dispensed with upon the completion of double-wire installation. The company at present employs one Japanese engineer in addition to its native staff.

New Telephone for Hankow.—Specifications for the contemplated telephone system for the Wuhan cities [Wuchang, Hankow, and Hanyang], have been completed and tenders soon will be called for in the Peking and Shanghai papers. Arrangements will undoubtedly be perfected whereby the telephone systems for the various foreign concessions in Hankow will be taken over by the Chinese Telephone Administration, as also the German system now in use in Hankow city, and one general system substituted therefor.

Payment for the new system will be made in four equal installments—one-fourth to be paid down at the time of the acceptance of tender, one-fourth upon delivery of the materials, one-fourth upon the completion of the installation and its acceptance, and the final payment two or three years thereafter. Although it has not been definitely decided as to how many telephones the new system will provide for, 2,000 or 3,000 will probably be called for and arrangements made whereby the system will allow of an expansion up to 10,000 instruments.

Hankow is a very important center in China, and will probably occupy a position in this country analogous to that of Chicago in the United States. The combined population of the three Wuhan cities is conservatively estimated at 1,000,000.

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Blowers

Frank L. Strong Machinery Co.

Boilermakers

Babcock & Wilcox, Ltd.
A. F. Craig & Co.
Taikoo Dock & Engineering Co.
Shanghai Dock & Engineering Co.

Boiler Tubes

Royles Ltd.

Boiler Fittings

Babcock and Wilcox
Shewan, Tones & Co.

Brass and Bronze Tubing

Broughton Copper Co., Ltd.

Bridge-Builders

White & Co., Inc., J. G.
Shanghai Dock & Engineering Co., Ltd.

Bridge Materials

United States Steel Products Co.

Building Materials

Haywood Bros. & Eckstein Ltd.
Malthoid Paraffine Paint Co.
W. H. Anderson & Co.

Cables, Telephone, Telegraph Supplies

Bellis & Morecom. Ltd.
General Electric Co.
W. T. Henley's Telegraph Works Co., Ltd.
Melchers & Co.
Westinghouse E. & M. Co.

Cables

Andersen, Meyer & Co.
Shewan, Tones & Co.

Cableways

Lidgerwood Mfg. Co.

Calorifiers

Royles, Ltd.

Carrriage Door Locks

Jos. Kaye and Sons Ltd.

Cars and Trucks (Railway)

Hurst, Nelson and Co.
Shewan, Tones and Co.

Car Wheels and Axles

Hurst, Nelson & Co., Ltd.
United States Steel Products Co.

Cattle Guards

Fairbanks, Morse & Co.

Cement

Anderson & Co., W. H.
Green Island Cement Co., Ltd.

Cement Machinery

Austin Drainage Excavator Co.

Centrifugal Pumps

Drysdale & Co.
Worthington Pump Co.

Chain Grate Stokers

Babcock & Wilcox, Ltd.

Chemical Extraction Plants

A. F. Craig & Co., Ltd.

Chimneys

Babcock & Wilcox Ltd.
A. F. Craig & Co.

Chromium Steel

Bohler Bros. & Co., Ltd.

Cigar and Cigarette Manufacturers

Cia. Gral. de Tabacos de Filipinas
Germinal Cigar Factory
Olsen & Co., Walter E.

Circuit Breakers

General Electric Co.
Westinghouse E. & M. Co.

Cloth Finishing Plants

Mather & Platt, Ltd.

Coal Handling Machinery

Babcock & Wilcox Ltd.

Coal Mining Co.'s

Kallan Mining Administration
Peking Syndicate, Ltd.
South Manchuria Railway Co.

Compressors, Centrifugal

General Electric Company

Concrete Mixers

Austin Drainage Excavator Co.

Concrete Reinforcement

Shewan, Tones and Co.
U. S. Steel Products Co.

Condensing Plants

Worthington Pump Co., Ltd.

Contractors, Electrical

Mather & Platt, Ltd.
Shanghai Dock & Engineering Co. Ltd.
Arnhold, Karberg & Co.
Shewan Tones & Co.
Frank L. Strong
Siemens China Co.
Dick, Kerr & Co., Ltd.

Contractors, (General)

Bohler Bros. & Co.
Frank L. Strong
Shanghai Dock & Engineering Co. Ltd.
White & Co. Inc., J. G.

Contractors Supplies

Austin Drainage Excavator Co.

Consulting Engineers

White & Co., Inc. J. G.

Conveyors

Babcock & Wilcox Ltd.

Copper Tubing

Broughton Copper Co., Ltd.
Corrugated Roofing

Corrugated Iron

American Rolling Mill Co.

Counting Machines

W. & T. Avery Ltd.

Couplers

McConway & Torley Co.

Cranes

Babcock & Wilcox Ltd.

Crushers

Lehigh Car, Wheel and Axle Wks.

Culverts

Corrugated Iron

Deodorising Oil Plant

A. F. Craig Co., Ltd.

Diamond Drill Boring

Peking Syndicate, Ltd.

Diesel Engines

Westinghouse E. & M. Co.

Diving Apparatus

A. J. Morse & Son

Door Locks

Jos. Kaye and Sons Ltd.

Drag Line Excavator

Lidgerwood Mfg. Co.

Drawing Instruments

Andersen, Meyer & Co.

Dredgers

Middleton & Co., Ltd.
Priestman Bros. Ltd.
Shanghai Dock & Engineering Co., Ltd.

Drop Steel Forging and Stamping

Anger Mfg. & Supply Co.

Dry Batteries

Andersen, Meyer and Co.

Drydocks

Shanghai Dock and Engineering Co.
Taikoo Dock & Engineering Co.
Hongkong and Whampoa Dock Co.
Mitsu Bishi Dockyards & Eng. Wks

Dyeing Plants

Mather & Platt, Ltd.

Economizers

Babcock & Wilcox Ltd.

Educational

International Correspondence Schools

Electric Hoists

General Electric Co.
Lidgerwood Mfg. Co.

Electric Lighting Plants

Andersen Meyer & Co.
Arnhold, Karberg & Co.
Dick, Kerr & Co., Ltd.
Westinghouse E. & M. Co.
Fearon, Daniel & Co.
General Electric Co.
Siemens China Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Shewan, Tones & Co.
Frank L. Strong Machinery Co.
U. S. Steel Products Co.
Western Electric Co.

Electrical Supplies

Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Jardine, Matheson & Co.
Babcock & Wilcox
Fearon, Daniel & Co.
General Electric Co.
Mather & Platt, Ltd.
Shewan, Tones & Co.
Siemens China Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.
Western Electric Co.

Engines

Shanghai Dock & Engineering Co., Ltd.
A. F. Craig & Co.

Evaporators

Royles Ltd.

Excavators and Elevators

Austin Drainage Excavator Co.
Priestman Bros. Ltd.
Shanghai Dock & Engineering Co., Ltd.

Explosives

Arnhold, Karberg & Co.
Curtis's & Harvey, Ltd.
Jardine, Matheson & Co.
Rendrock Powder Co.

Fan Blowers

Drysdale & Co.

Feed Water Heaters

Babcock & Wilcox, Ltd.
Royles, Ltd.

Ferro Manganese

U. S. Steel Products Co

Files

Bohler Bros. & Co., Ltd.

Filters (Mechanical)

Mather & Platt, Ltd.

Firebrick

W. H. Anderson & Co.
Kallan Mining Administration

Fire Engine

Dick, Kerr & Co., Ltd.

Fire Prevention Apparatus

Mather & Platt, Ltd.

Filament Lamps

Dick, Kerr & Co., Ltd.
Frank L. Strong
Siemens China Co.
Westinghouse E. & M. Co.

Flat Turret Lathe

Jones & Lamson Mch. Co.

Folding Chairs

Simmons Mfg. Co.

Food Products

Anderson & Co., W. H.

Forwarding Agents

W. H. Anderson and Co.

Fuses and Fuse BlocksGeneral Electric Co.
Westinghouse E. & M. Co.**Galvanized Roofing**

American Rolling Mill Co.

Gas EnginesMather & Platt, Ltd.
Worthington Pump Co., Ltd.**Gasoline Lighting Plants**

Andersen, Meyer & Co.

Gas Producer Plants

Westinghouse E. & M. Co.

Gears, Silent

General Electric Co.

Generators, Electric

General Electric Co.

Graphite Paint

J. Dampney & Co.

High Speed Engines

Drysdale & Co.

Hoisting Engines

Lidgerwood Mfg. Co.

Horse Shoes

U. S. Steel Products Co.

HoseGeo. Angus & Co.
Interlock Metal Hose Co.
F. Reddaway & Co., Fire Hose "Sphincter Grip," Armoured Hose, etc.**Hotels**South Manchuria Railway.
Chosen Railways**Ice Machinery**

Vulcan Iron Works

Insulating Material

Micanite & Insulators Co., Ltd.

Insurance

Stevenson & Co., Ltd., W. F.

Ironfounders

A. F. Craig & Co.

Job Printers

Commercial Press

Journal Boxes

T. H. Symington Co.

Knitting Machines

Shewan, Tones and Co.

Lanterns and Lamps

Andersen, Meyer and Co.

LocksJoseph Kaye & Sons, Ltd.
Shewan, Tones & Co.**Locomotive Speed Indicator and Recorder**

Hasler Telegraph Works.

Locomotive Headlights

Pyle-National Electric Co.

Logging Machinery

Lidgerwood Mfg. Co.

LubricantsAlbany Lubricating Co.
Standard Oil Co.
W. H. Anderson & Co.**Lumber Dealers**Robert Dollar Co.
Jardine, Matheson & Co.
Norton Harrison Co.
Shewan, Tones & Co.**Machinery Merchants**Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Shanghai Machine Co.
Fearon, Daniel & Co.
Frank L. Strong
Schuchardt & Schutte,
Shanghai Dock & Engineering Co., Ltd.**Machine Tools**American Tool Works Co.
Jones & Lamson Mch. Co.
Schuchardt and Schutte.**Marine Engines**Fairbanks, Morse & Co.
W. F. Stevenson & Co., Ltd.**Manganese Steel**Edgar Allen & Co.
Bohler Bros. & Co., Ltd.**Manila Rope**Johnson Pickett Rope Co.
Ynchausti & Co.**Measuring Instruments**General Electric Co.
Westinghouse E. & M. Co.**Meat Products**

W. H. Anderson & Co.

Mechanical Rubber Goods

F. Reddaway & Co.

Meters, Flow-Air, Gas and Water

General Electric Co.

Mill MachineryShanghai Dock & Engineering Co., Ltd.
A. F. Craig & Co., Ltd.**Mine Locomotives**

General Electric Co.

Mine Prospecting and Development

Peking Syndicate, Ltd.

Mineral Oil Plants & Machinery

A. F. Craig & Co.

Mining MachineryMelchers & Co.
Shanghai Dock & Engineering Co., Ltd.
Shewan, Tones & Co.
Gould's Manufacturing Co.**Motor Omnibus**

Hurst Nelson and Co., Ltd.

MotorsGeneral Electric Co.
Shanghai Dock & Engineering Co., Ltd.**Motor Launches**

Shanghai Dock & Engineering Co., Ltd.

Motor Spirits

Standard Oil Co.

Motor TyresFirestone Tire and Rubber Co.
F. Reddaway & Co.**Motor Vehicles**Commercial Car Co.
Fairbanks Morse & Co.**Oil Break Switches**General Electric Co.
Westinghouse E. & M. Co.**Oiled Cloths and Papers**

Micanite and Insulators Co., Ltd.

Oil Engines

Fairbanks, Morse & Co.

Oil Mill Machinery

A. F. Craig & Co.

Oil Separators

Worthington Pump Co., Ltd.

Oilwell Casing and Tubing

U. S. Steel Products Co.

Ozone Machines

Siemens China Co.

Packings

F. Reddaway & Co.

Paints, Oils and VarnishStandard Oil Co.
Albany Lubricating Co.**Photo-Engravers**

Commercial Press

Piling (Sheet Steel)

U. S. Steel Products Co.

Platform Scales

W. & T. Avery, Ltd.

Power Plants

Frank L. Strong Machinery Co.

Printing MachineryJardine, Matheson & Co.
Shewan, Tones Co.**Pulleys (Steel)**Schuchardt & Schutte
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.**Pulverizers**

Lehigh Car, Wheel and Axle Works.

PumpsAnderson, Meyer & Co.
Drysdale & Co. Ltd.
Fairbanks, Morse & Co.
General Electric Co.
Jardine, Matheson & Co.
Joseph Evans & Sons
Mather & Platt, Ltd.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Shewan, Tones & Co.
The Goulds Manufacturing Co.
Worthington Pump Co.**Pulverizing Mills**

Lehigh Car, Wheel and Axle Wks.

Radial Drills

American Tool Works Co.

Railometers

W. & T. Avery, Ltd.

RailroadsChinese Government Railways
Chosen (Korea) Railways.
South Manchuria
Southern Pacific Co.**Railroad Supplies**American Locomotive Co.
Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Baldwin Locomotive Works.
Robert Dollar Co.
Dick, Kerr & Co., Ltd.
Fearon, Daniel & Co.
Fairbanks, Morse & Co.
Hurst, Nelson & Co., Ltd.
Jardine, Matheson & Co., Ltd.
Lima Locomotive Works.
McConway & Torley Co.
Pyle-National Electric Co.
Railway Signal Co., Ltd., The
T. H. Symington Co.
Shewan, Tones & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.**Rail Weighers**

W. & T. Avery, Ltd.

Railway Signals

Railway Signal Co.

Railway Weighbridges

W. & T. Avery, Ltd.

Refrigerating MachineryAnderson, Meyer & Co.
Vilter Mfg. Co.
Vulcan Iron Works.**Reinforced Concrete Construction**Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.**Rheostats**

General Electric Co.

Road Rollers

W. F. Stevenson and Co.

Roofing MaterialsAmerican Rolling Mill Co.
W. H. Anderson & Co.
Norton & Harrison.
U. S. Steel Products Co.**Rope Manufacturers**Johnson-Pickett Rope Co.
U. S. Steel Products Co.
Ynchausti & Co.
Shewan, Tones & Co.**Rotary Converters**General Electric Co.
Westinghouse E. & M. Co.**Rotary Dryers**

Lehigh Car, Wheel and Axle Wks.

Rubber Tyres

Firestone Tire and Rubber Co.

SafesW. H. Anderson & Co.
Mustard & Co.
Shewan, Tones & Co.**Safety Valves**

Royles, Ltd.

Saw Mill Machinery

Andersen, Meyer and Co.

Scales

W. & T. Avery, Ltd.

Sewer Pipe & Tile

W. H. Anderson & Co.

Sheet Steel

U. S. Steel Products Co.

Shipping AgentsCla. General de Tabacos
Shewan, Tones & Co.
Stevenson & Co., Ltd.**Shipbuilding and Repairs**Flat-san Giorgio Ltd.
Tsingtau Werft
Hongkong & Whampoa Dock Co., Ltd.
Mitsu Bishi Dock and Engineering Works
Shanghai Dock and Engineering Co., Ltd.
The Talkoo Dockyard and Engineering Company of Hongkong, Limited**Ship-Chandlery**

Ynchausti & Co.

Steamship CompaniesCla. Transatlantica.
Robert Dollar Company.
Pacific Mail S. S. Co.
Ynchausti & Co.
Toyo Kisen Kaisha.**Steam Hoists**

Lidgerwood Mfg. Co.

Steam Kettles

Royles Ltd.

Steam TurbinesDick, Kerr & Co. Ltd.
General Electric Co.
Westinghouse E. & M. Co.**Steel Manufacturers**

United States Steel Products Export Co.

Steel WorksBohler Bros. & Co., Ltd.
U. S. Steel Products Co.**Stokers**

Babcock & Wilcox Ltd.

Stretchers

Simmons Mfg. Co.

Structural SteelBohler Bros. & Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.**Sugar Machinery**

A. F. Craig & Co.

SuperheatersBabcock & Wilcox Ltd.
Schmidt Superheating Co.**Tanks**Pacific Tank and Pipe Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.
A. F. Craig & Co.**Telephones**Anderson, Meyer & Co.
Kellogg Switchboard & Supply Co.
The Western Electric Co.
Westinghouse E. & M. Co.**Testing Machines**

W. & T. Avery, Ltd.

Textile Machinery

A. F. Craig & Co.

Tiles and BricksGreen Island Cement Co., Ltd.
Kailan Mining Administration.**Tin Plates**

U. S. Steel Products Co.

Tobacco DealersBritish-American Tobacco Co., Ltd.
Cla. General de Tabacos
Olsen & Co., Walter E.**Tools**American Tool Works Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.**Tool Steel**Bohler Bros. & Co. Ltd.
U. S. Steel Products Co.**Towers Cooling**

Worthington Pump Co., Ltd.

Track Gauges and Levels

Fairbanks, Morse & Co.

Tramcars

Hurst, Nelson & Co. Ltd.

Tramway EquipmentDick Kerr & Co. Ltd.
Westinghouse E. & M. Co.**Tramway Supplies and Specialties**

Anger Mfg. & Supply Co., Ltd.

Transformers, Electric

General Electric Co.

Trucks

Commercial Car Co.

Tube Mills

Edgar Allen & Co.

Tungsten Steel

Bohler Bros. & Co., Ltd.

Turbine Pumps

Worthington Pump Co., Ltd.

Turbines, Steam

General Electric Co.

Turbo-Blowers

Westinghouse E. & M. Co.

Turret Lathes

Jones and Lamson Mch. Co.

Valves

Shewan, Tones & Co.

Vanadium Steel

U. S. Steel Products Co.

Vegetable Oil Plants.

A. F. Craig & Co.

Ventilating Apparatus

Shewan, Tones & Co.

Water Softeners

Babcock & Wilcox Ltd.

Waterworks EquipmentEdgar Allen & Co. Ltd.
Worthington Pump Co.**Weaving Machinery**

Shewan, Tones & Co.

Weighing Machines—Weigh Bridges

W. & T. Avery, Ltd.

Welding Outfits, Electric Arc.

General Electric Co.

Windmill

Fairbanks, Morse & Co.

Wireless Telegraph Apparatus**Wire Nails**

U. S. Steel Products Co.

Wire Rope and CablesBohler Bros. & Co., Ltd.
U. S. Steel Products Co.**Wood Working Machinery**American Tool Works Co.
Defiance Machine Works
Shanghai Dock & Engineering Co., Ltd.**Wrenches**

Trimont Mfg. Co.